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GeForce FX 5950 Ultra vs Radeon 9800XT
Get set for the battle of the titans in the video card smackdown of 2003.

Microsoft Small Business Server 2003

Adobe Photoshop CS

321 Studios DVD X Copy

Dell P1500

Avocent SwitchView SV400UA-AU

Pioneer Power 8355

ASUS L5800GM

IBM ThinkPad R50

ADOpen Openbook B165

Toshiba e800

Borland C++BuilderX

PHP-Nuke 7

and more...

Labs Challenges

DVD-playing software

DVD-playing programs make it easy to turn your PC or notebook into an entertainment system. *Serdar Yegulalp* screen tests five of the finest.

Cordless keyboards and mice

Competition is alive and clicking in the cordless world. *APC* compares keyboards and mice that do away with cable clutter.

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need to know

News, views and analysis from the IT world

- An attempt to insert a backdoor into the Linux kernel has only just been thwarted, and critics say it exposes the vulnerability of open source.
- With over three million downloads already, can Skype become the Kazaa of the VoIP space?
- A catch-22 with a Dell end user licence agreement indicates that some tech companies don't take them very seriously.
- Linux coders can still find glory when the world runs on Microsoft. Just look at Australia's newly-crowned geek pin-up Andrew Tridgell.
- Just how big is a megabyte? Some people are willing to go to court to find out.

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January 2004

WORKSHOP

Hands-on with hardware and software, plus bonus CD content

Windows Script Host

The Script Host holds the key to automating and simplifying a myriad of tasks under Windows. In the first of a three-part series, *Serdar Yegulalp* examines what a Windows script is and how you can put it to work.

Updating Windows

Serdar Yegulalp sorts through Windows' service packs, patches, hotfixes and roll-ups to bring your PC up to date.

Borland C++BuilderX

Follow along with the free version on the cover CD as *David Williams* takes C++BuilderX for a spin.

Web optimisation for handhelds

Don Sorcinelli explains how you can optimise Internet and intranet sites for viewing on Pocket PC handhelds.

Free Photoshop plug-ins

Who says you can't get something for nothing? *Trevor Morris* has rounded up more than 50 of the finest Photoshop plug-ins — and they're all free.

ebooks

Jenneth Orantia demonstrates how you can carry thousands of books in your pocket, so you'll be ready for a great read wherever you are.

Ximian Evolution

Ximian's mighty Evolution is more than just an open source Outlook clone. *Mike MacCana* reveals the power of this Linux information manager.

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TECHLIFE 137



From shooters and sports sims to racers and, err, more racers — here's our call on the ten hottest games of the year.

Games

Call of Duty; Pro Evolution Soccer 3; Counter-Strike; Condition Zero; Max Payne 2; Crimson Skies.

All new and renewing subscribers this month

will get a

FREE cap

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APC's privacy statement is on page 144.

Tweak-XP Pro 2.0
The ultimate program that makes Windows XP fast, secure and personalised.

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The only Windows 98/98SE/9x tweak that makes everything the way you want it.

Paragon Partition Manager 2002
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Looking at Longhorn
The next version of Windows. See how it will change the way you work and play. Includes a preview of the new Windows XP.

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Tweak-XP Pro 2.0

Full version

This award-winning program is the king of XP tweaking tools — and it's yours

free, exclusive to APC. Uncover a wealth of hidden settings to boost speed and tailor the interface without risky registry hacks. Tweak-XP Pro optimises Windows to suit your CPU, graphics card and even your ISP connection. See page

104 for more details on how this program puts you in charge.

As sold for \$55

Tweak-ME Gold

Full version

Using Windows 98, 98SE or Me? We didn't forget about you.

Tweak-ME Gold has the same simple interface, system optimisation and customisation controls as Tweak-XP. It also frees memory and keeps your PC's clock in perfect time.

Check out page 104 for more info.

As sold for \$35



When you see this CD icon in APC, it means there's bonus software on the cover CD set.

Linux Evolution

Ximian's personal information manager goes beyond the usual email, calendar, contact and to-do list functions to provide a stack of unique features. We've got the latest release of Evolution 1.4 plus plug-ins and tools to tap into Evo's full potential, along with two pages of power tips on page 134.

ebook explosion

Turn your Palm or Pocket PC into your personal library. We've bundled together dozens of free ebooks to get you started, along with ebook readers for both PDA platforms. Flick to page 132 of this issue for details on how to use ebooks, where to find more of them, and how to create your own.

Windows customisation

Do Windows your way with this amazing collection of free tools to tweak and tune the OS. From smart little system hacks to full-blown replacement apps and skinning tools for a complete interfacelift, it's guaranteed to put you in control. Our how-to feature starts on page 94.

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Full-working versions

Tweak

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- Tweak-ME Gold — full version
- Special offer
- Tweak-XP 3.0 trial

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- Paragon Partition Manager 2002
- Plus, special offer
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- Chris Anderson and Don Box's Longhorn Introduction Video
- Longhorn Architecture Diagram
- Privacy-Enabling Enhancements in the Next-Generation Secure Computing Base

C++BuilderX Personal

Dive into the new wave of C++ programming with Borland's just-released C++BuilderX.

Full version



This is a full working version of the Personal edition, and it's yours free.

Looking at Longhorn

You've read the previews and reports, including our feature on page 72 of this issue. ... now take a guided video tour through the interface of this next-gen release of Windows. We've also included Microsoft's own Longhorn briefing video plus a white paper on OS security.

Partition Manager 2002

Reclaim wasted disk space, create new partitions or resize existing ones, convert file systems and run two or more operating systems on the one PC.

Paragon Partition Manager 2002 makes it all safe and easy.



Photoshop filter frenzy

Who says you can't get something for nothing? Here are 58 of the finest Photoshop plug-ins — and they're yours free. Add extra features and file format support or discover wicked new effects. There's also a plug-in manager to help you keep on top of things. See page 131 for more details.

APC 2003 PDF archive

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- Longhorn: Watching the Time
- Longhorn: Keep in Touch
- Longhorn: Music to my Ears
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DVD software

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JANUARY 2004

Welcome to another great Aussie summer, and another APC "Summer special". What makes this edition so special, you might ask?

It's not just the typical serving of relevant news and incisive analysis. And it's more than the exclusive reviews of the latest products to arrive down under. It even goes beyond all those hands-on Workshop articles that help you get much more from your machine. After all, you get that and much more in every issue of APC.

But January is when we work extra hard to bring you an extra serve of summer reading for that one time of the year when we can all relax, put our feet up and take a break from the mad pace of the other 50-odd weeks.

It starts with 25 pages of power tips for every version of Windows, from 9x to 2000 and XP. Disable the settings that drive you mad, automate those boring chores, customise the interface a dozen different ways to suit you, even reshape the OS for a totally different look and feel. It's all about taking control and doing Windows your way.

And because we know that many die-hard users run Windows Server at the core of their home networks, we've included the best ways to optimise Windows 2000 and 2003 Server machines.

If you're itching just to get away from the PC for a while, you can tackle our second annual National Geek IQ Test. Pit your brains against fellow APC readers on everything from programming and PC history to geek culture. We want to know how you fare, and welcome the odd nitpick about the answers — we're not above getting out-geeked by our readers!

And just in case that new desktop PC didn't arrive for Christmas, we're giving one lucky geek the chance to win a Pentium 4 "mean machine" and software worth \$6,500.

So grab a drink, kick back and enjoy a slice of well-earned downtime — and thanks for spending some of it with us.

David Flynn

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need to know

News, views and analysis from the IT world

Hacking into Linux's heart

An attempt to insert a backdoor into the Linux kernel has barely been thwarted, and critics say it exposes the vulnerability of open source.

Dan Warne reports.

A subtle hack that would've given those in the know complete root access to any Linux-based system was detected and removed within 24 hours, according to Linux creator Linus Torvalds.

The affected code originated from an unprotected computer in a university lab, which itself had a Trojan horse "root kit" added after Linux was installed.

Open source advocates say the quick pick-up is proof of Eric S. Raymond's famous quote about open source: "Many eyes make all bugs shallow". Torvalds said the main reason the hack failed was that Linux development didn't use open code trees that could be modified by anyone. The change was made to a copy of the central code tree he manages directly.

Critics say the hack highlights the risks in open source development methodologies.

the kernel that's available for public download.

On casual inspection, the code appeared to be a change made by long-time kernel developer Dave Miller to add some basic error-checking functionality to a low-level system call, `Wait4()`. But it wasn't checking whether a thread was being called by the root user; it was constructed to assume the root user was making the call, essentially giving full system control to anyone who knew of the backdoor's existence.

The hacker hoped anyone scrutinising the code wouldn't notice that one equals sign had been used instead of two. In the C programming language, two equals signs make a comparison of two values, while one sets a value.

The hack was so subtle that the maintainer of the Linux kernel source code tree, Larry McVoy, thought it was a proper change that hadn't been submitted through the normal channels.

Every Linux-based machine in the world would've had a critical security flaw

But the senior director of Symantec Security Response, Vincent Weafer, told *APC* that both sides had vulnerabilities, and even Microsoft had experienced a close shave with a hacker attempting to modify Windows' source code.

"The QAZ worm was used to get access to Microsoft source code in 2000," he said. "A Microsoft employee's laptop was infected with the worm, and sent out passwords for Microsoft's code servers onto the Internet."

The hacker hadn't modified the source code, though he had attempted to blackmail Microsoft, which promptly went public over the issue, Weafer said.

EQUALS DON'T ADD UP

The Linux kernel hack involved adding two lines of seemingly innocuous code to a copy of

He complained in a discussion list that the change shouldn't have been made directly to the code. "It's not a big deal, we catch stuff like this, but it's annoying to the CVS users," he said. "If anyone can step forward and claim responsibility, that would be nice."

Experienced Linux developers reading the list were curious to see the changed code. "Out of curiosity, what were the changed lines?" asked developer Matthew Dharm. "That looks odd," replied Zwane Mwaikambo, noting that the two lines of code seemed generally unnecessary.

"Not if you hope to get root," Andries Brouwer remarked, picking up on the incorrect syntax.

The code management system used to hold the Linux kernel code is, by design, very



► Close call: ghostly hands have tried to hack into Linux.

also in need to know:

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Unlimited Skype

With over three million downloads already, can Skype become the Kazaa of the VoIP space?

Niklas Zennström gives it a try and he takes away. As one of the founders of Kazaa, he created a behemoth that indirectly increased the IP traffic levels of telecommunications companies. Now, as CEO and co-founder of Skype, he's controlling the fortunes of a 3MB proprietary-source application that directly threatens the revenues of telcos.

Since Skype's late-August launch, engineers have been working on the program's limitations. Both caller and receiver must be connected to the Internet; they both need a microphone; and calls to regular phones and conference calls aren't possible (although its developers claim that they are "coming"). Videoconferencing is only on the wish list. Connections through proxies or firewalls requiring user authentication are also presently unable to use the service.

Nevertheless, Skype's simple interface and "buddy" system make it a strong contender to be the ICQ of Voice over IP (VoIP). It's elementary to operate, user-friendly and works where other solutions get bogged down in firewall and network translation (NAT) issues. Users on translated (NAT-affected) nodes gain access when Skype finds open clients on the network. Skype's makers aren't

giving the game away when it comes to how the client does this, or how the program zips around gateway routing and personal firewalls. Average Internet users simply don't care—the important thing is that it works.

Sound quality is variable—multiple codecs are used depending on the quality of the connection. Skype's Web site (www.skype.com) claims a rate of

3-16KB/s. The data stream that carries voice or text information is encrypted in 256-bit AES (Advanced Encryption Standard).

As with Kazaa, the founders of Skype are promising that the app's basic functions will remain free. Extras such as calls to regular phones or SIP phones (Session Initiated Protocol, a key open standard for VoIP) and conference calls will attract a charge. Pricing is expected to be announced this year.



Telco terminator: Skype has the potential to hit profits hard.

Kazaa's owners, Sharman Networks, are evaluating the application, including its market feasibility. "It looks like an exciting application of P2P as an effective, efficient communications tool," enthused Sharman's director of technology, Phil Morle.

"[Skype] demonstrates that P2P is a powerful technology delivering benefits much more far-reaching than just sharing licensed music files."

Justin Kranz

▶ Continued from page 13

secure, with many automated checks to ensure unauthorised changes can't be made. Torvalds uses the proprietary code management system BitKeeper to merge the thousands of changes made to Linux every year.

Most developers still use the free software Concurrent Version System (CVS), provided with every Linux/UNIX installation. "It has its limitations, but it's free and does the job," said one developer.

However, code tree custodian McVoy told APC that the CVS system is known to be relatively insecure, which is why Linux code is held in a separate, proprietary system. "Most CVS trees are closed for writing. But CVS is notoriously riddled with security holes, so that doesn't mean much," he said.

WORST-CASE SCENARIO

A one-way synchronisation of the Linux kernel source code is done from the authoritative BitKeeper system to a CVS repository on a daily

basis for members of the public to download onto their local machines.

The hack was made directly to the code held in CVS, stored at <http://linux.bkbits.net>. The certified code held in the BitKeeper system, from which companies like RedHat source the base code of Linux, was unchanged.

But if an external developer had downloaded the hacked CVS code, then made a genuine modification to Linux and submitted it to Torvalds for inclusion in the kernel, it may have eventually been approved for inclusion in a new release such as the upcoming 2.6 kernel. In a worst-case scenario, every Linux-based machine worldwide running the latest kernel would've had a critical security flaw at the heart of the system, allowing a hacker to take control of the computers for a massive denial of service attack, or read, delete or modify files on any computer.

"If we weren't trained to trust no-one then this problem would have gone unnoticed, and the CVS users could have sent in a patch that

included this Trojan horse and compromised Linux," McVoy said.

He plans to introduce extra levels of security into the conversion process between the BitKeeper system and CVS, using public key encryption so that changes could quickly be verified as genuine or not.

"The fact that the journalists are all in a tizzy about it is, well, weird from an engineering perspective. These things happen. It's our job as engineers to deal with it. We did. That should be the end of the story."

Nevertheless, the event has planted the first seeds of doubt about open source security.

"What's the guarantee that this isn't the first event of a backdoor in the kernel, and that we haven't missed such events in the past and that [bad] code is not [already] circulating?" wrote an anonymous poster at <http://kerneltrap.org>, which published an archive of the email discussion that led to the discovery.

Torvalds said he knew of no previous attempt to maliciously add Trojan horse code to the Linux kernel. ■■■■

Case of the missing megabytes

What exactly is a megabyte? Some members of the public are willing to go to court about it.

Frustrated consumers have taken a class action against major PC makers, alleging they misled the public about hard drive capacity. The case has re-ignited similar concerns in Australia over deceptive broadband advertising.

Dan Lanchau, Adam Selkowitz, Tim Swan and John Zahabian brought the class action against Apple, Dell, Gateway, HP, IBM, Sharp, Sony and Toshiba in the Los Angeles Superior Court, alleging that all eight manufacturers overstate the size of the hard drives shipped with their computers.

The problem arises from the way operating systems measure data, counting a gigabyte as 1,024 megabytes, while hard drive manufacturers classify a gigabyte using the International Electrotechnical Commission (IEC) standard of 1,000MB.

The IEC changed measurements in 1998 so that what computer users considered a gigabyte (1,024MB) was renamed a "gibibyte". A gigabyte is now formally considered to be 1,000MB, even though no computer operating systems use this definition.

The complainants say that, as a result, hard drives advertised as 20GB provide only 18.6GB of actual capacity, as measured by operating systems like Windows, and this can confuse consumers.

Australian Internet users have complained of the same deceptive advertising with broadband plans. Telstra, for example, advertises a 3GB plan, but uses the NIST standard of 1,000MB per gigabyte. As a result, a customer who downloads 3GB of files using this plan will pay excess usage penalties for running over their limit by 72MB.

Telstra's Stuart Gray told APC: "For the purposes of calculating usage, we say on our Web site that 1GB equals 1,000MB, and there's really nothing more to say".

LITTLE EXTRAS ADD UP

The problem is that both forms of measurement are valid, according to Andrew Perry, head of IP and technology at Gadens Lawyers Sydney. "There are much better defined standards in food labelling than in computer products," he said.

"In respect to broadband data download cases, there's a risk that, for example, if you go into your excess usage, you may end up paying a \$15 difference on a 3GB plan if a gigabyte is calculated as 1,000MB instead of 1,024MB. Unfortunately it's a small amount, so the



► **Baffled:** both Halmes and his haund had to admit that they wouldn't know a gibibyte if it bit them.

average consumer won't bother [to take action over it]. But when you're a large company, the little bits of extra revenue all add up.

"A class action can help to equalise the power between both sides because individual consumers band together to minimise the costs. The best way to approach these things, however, is often to get the Australian Competition and Consumer Commission (ACCC) or the Technology Industry Ombudsman to investigate the issue so costs are borne by the regulator rather than the consumer."

The Australian Consumers' Association's Charles Britton said he thought it unlikely that a class action in Australia would succeed, but called for better labelling standards. "The point is, computer science isn't wrong. When you work in binary mathematics, 1,024MB in a gigabyte is correct.

"But standards have settled on thousands, so you've got a disjunction. In the case of hard drives, there should be clearer measurements on packaging and advertising, like '20GB hard drive (18.6GB of disk space)'."

He called on broadband providers to express their plans in terms of thousands of megabytes of usage rather than gigabytes in order to avoid ambiguity.

The ACCC told APC it was monitoring the United States case closely, but it would be pre-emptive to comment on whether it would consider taking similar action against PC manufacturers in Australia.

Standards Australia's Mark Bazina told APC that no Australian standard covered data measurement, so the internationally recognised standard of 1,000MB per gigabyte, and 1,000,000 kilobytes per megabyte was used.

But he said there is considerable confusion over definitions among consumers, and even within the industry itself. "Not everybody knows what a megabyte is."

According to the US National Institute of Standards and Technology (NIST) Web site, computer memory manufacturers use megabyte to mean 1,048,576 bytes, but the manufacturers of computer storage devices usually mean 1,000,000 bytes.

"Some designers of local area networks have used megabit per second to mean 1,048,576bit/s, but all telecommunications engineers use it to mean 10⁶bit/s."

"And if two definitions of the megabyte are not enough, a third megabyte of 1,024,000 bytes is the megabyte used to format the familiar 3.5 inch '1.44MB' floppy disk."

Dan Warne

Dell's no-nuke notebook

A catch-22 with a Dell end-user licence agreement indicates that for some tech companies it's just about lip service.

Having bought a new Dell laptop, Canadian Ian Goldberg was surprised by a message that appeared before boot-up, as soon as the machine was switched on: "Press any key on the keyboard to indicate that you have read all of the software licences and agree to their terms".

Goldberg wanted to read the licences' terms and conditions because he intended to install Linux rather than accepting the Windows licence agreement. But he soon discovered that he couldn't read the agreement in the box without accepting it first.

"Customer agrees that it will be bound by the license agreement once the package is opened or its seal is broken," Dell's terms and conditions stated.

He phoned Dell and was told he should use a friend's Net connection to read the software licence on the Dell Web site.

"If they had said anything reasonable, we would have been happy to just install Linux on the thing and be done with it," wrote Goldberg on the Cypherpunks Web site. "But they were saying that anyone who uses a Dell laptop [with this startup screen] has to lie about having read the licences, and just blindly agree to them.

"That's unacceptable enough that [the laptop's] going back."

Cameron Abbott, IT law partner at Middletons, said if a customer was asked to agree to a licence they were unable to read, the vendor would be on shaky ground in court. "It is difficult to see how the contractual principles of offer and acceptance can apply if I have to accept the terms before I can read them," he said.

Dell said Australian customers were able to open the shrinkwrap packaging without automatically accepting Dell's software licences.

Legal experts told APC that software buyers often have more rights than they realise.

"Many overseas software vendors don't customise their licences for use in Australia," said Tim Gole, a lawyer for Gilbert and Tobin. "The *Trade Practices Act* says that products sold must be merchantable quality and be fit for their purpose.

"If a software company writes into its contract that it has no liability for anything that might go wrong, it is committing an offence under the Act, and that part of their contract would also be invalid."

NUCLEAR NAUGHTY

Computer companies are also using contracts for frivolous public relations purposes, said Michael Park, a senior associate at Deacons. "I've seen a number of clauses coming out of the United States like, 'This contract is terminated if you use our products for the purposes of creating nuclear energy.'"

Dell's terms and conditions say customers' new computers "may not be sold, leased or otherwise transferred to, or utilised by, an end-user engaged in activities related to weapons of mass destruction".

Dell Australia's corporate affairs manager Nicole Gemmell said, "We're working with the US Government there. We're a worldwide company. That clause keeps us in compliance with US regulations."

Park disagreed. "The feel-good factor seems to be taking over from commercial reality. A lot of these big companies seem to be using EULAs so they can run PR lines to their shareholders about their nuclear-free status, or their opposition to weapons of mass destruction. "It seems very odd to me. It adds to that



► **Terrorism alert:** turn your laptop into a weapon of mass destruction and you'll nullify the licence agreement.

issue of just how fair these shrink-wrap or click-wrap end-user licence agreements are."

Dan Warne

Is it legal . . .

to report security holes in software?

There are many reasons why you should be careful about exposing anything that hackers could find useful. For one, virus outbreaks are common after news of a big Windows bug hits the Web (Blaster anyone?). With potential virus outbreaks at stake, some software vendors are turning to the Digital Millennium Copyright Act (DMCA) to stop bug reports from going public.

Twenty-two-year-old researcher Luigi Auriemma of Milan was issued with a cease-and-desist letter to remove reports on his Web site about security holes in the



GameSpy service, while HP, Adobe and SunComm have also launched legal action in the past.

Not everyone that posts bugs gets busted although, to be on the safe side, it's best to contact the vendor directly.

Exchange: Andrew Tridgell

Linux coders can still find glory when the world runs on Microsoft.

Just look at Australia's newly crowned geek pin-up.



Unlike Bill Gates and the other big commercial software figures, Andrew Tridgell earned his stripes creating a free download — the Samba code that allows Unix to talk to Windows. Little more than a decade later, "Tridge" is a hero to millions of Linux geeks around the world and *The Bulletin* magazine recently named him the top IT innovator in its list of Australia's "Smart 100" people. The award is deserved recognition for free software coders who have toiled away for more than a decade in obscurity. But with the open source movement that helped fuel Samba's success now under attack from commercial interests, is there still room for home-grown innovation?

Samba broke down barriers between Windows and Unix. Are those barriers still breaking down?

A new barrier is the remote filesystem search that Microsoft added in Windows 2000. This system allows you to search a remote network drive using a pre-computed index on the server, rather than by retrieving all the files. At the moment we haven't figured out how to work with the necessary protocol pieces to integrate with that, though I'm sure we will before long.

At the same time, we see old barriers disappear. More and more documents, formats

Most of these ideas aren't successful in terms of producing something that becomes widely used, but the huge number of such projects inevitably leads to some really interesting and innovative ideas.

Are we encouraging enough imagination and innovation among home-brew coders and hackers?

The complexity of modern software is much greater than it was in the past, which tends to make getting started more of a challenge.

On the other hand, the tools and examples available to hobbyists these days are vastly better than what was available a few years ago. Within a few minutes of starting searching on Google you can find free source code for just about any type of program you are interested in, and a vast array of support libraries that show you how to perform amazing software engineering tricks.

Has the success of Linux and open source meant a change in developers' attitudes and the way they are educated? Or is there an entrenched Microsoft-centric view?

In some places the "One Microsoft Way" attitude is indeed very deeply entrenched, but I am delighted to observe that more and more schools and universities are introducing their

concentrate on an individual rather than on a team effort when praising a project.

Do you think there's a concerted "anti-GPL" campaign in the industry? (The GPL allows anyone to view and modify software source codes, though conditions apply.)

Obviously some sections of the computing industry feel threatened by the GPL and the community effort that it often represents. Luckily, this is balanced by other parts of the industry, which understand the importance of what's being done by the free software community and embrace it wholeheartedly. I'm rather optimistic that the efforts to discredit the GPL won't succeed.

There are some aspects of the GPL that could be clarified and perhaps will be, but I am really rather impressed by how it's survived so well in terms of relevance and usefulness, despite major changes in the computing industry since it started. Perhaps this is just another example of the importance of concentrating on basic principles which don't tend to change very rapidly.

What do you make of Microsoft's softening stance towards open source, and the fact that it's shared parts of its source code?

I think that these efforts have thus far failed to capture the essence of cooperative development, community spirit and meritocracy that the free software community has embraced. I would be delighted to see Microsoft come up with a solution that works for them and produces a cooperative community, although I suspect they'll first need to give up some of the control that they seem to guard so jealously.

Does Red Hat's new focus on Enterprise Linux mean that open source hobbyists will be forgotten?

While Red Hat might be concentrating on larger customers, they certainly don't seem to be abandoning the hobbyist community, as evidenced by the considerable effort they are putting into Fedora and many other projects.

I think it's incorrect to assume that non-Enterprise users are exclusively served by hobbyists. There are a huge number of small Linux companies that support small businesses. **Andrew Tridgell spoke to William Maher.**

The complexity of modern software is much greater

and applications from the Windows world are becoming available to Unix users, and Windows users are getting better methods for using the powerful data-processing tools from the Unix world via systems like Cygwin. We live in interesting times.

Is enthusiasm for programming decreasing in the commercial programming world?

I think there are plenty of programmers in the commercial sphere who are enthusiastic about their work, but it's perhaps less common that they have the same flexibility that's possible in the free software world.

Time constraints and the risk-averse nature of modern business practices means that some of the more experimental computing ideas often find their true home in either an academic setting or among the hobbyist communities.

students to alternative ways of doing things, including using Linux and free software.

In many ways this marks a return to the way that computing was taught before Microsoft became dominant. In the early days of computing it was standard for computing students to have access to the entire source code of the system they were using, and to tinker with it to see how it worked.

Are software developers given the respect they deserve? Have attitudes changed?

In the free software world, individual developers do get a lot of recognition, and I think that sometimes (particularly in my own case) they get more than they deserve!

Sometimes it's hard to ensure that everyone who contributes to a project gets recognition, because many people like to

The truth is out there

Forget overclocking, the new trend for tech train-spotting types are conspiracy theories.

INTEL THE "INTIMIDATOR"

Could there be more dirty dealing in the Intel versus AMD battle than we've been led to believe? When some major PC brands didn't throw their names behind AMD's recent Athlon 64 launch, the underdog couldn't resist a subtle dig at its bigger rival.

AMD president Hector Ruiz said several big names were missing (HP anyone?) because they were too "intimidated" to show up. He also suggested that some PC makers had backed out from agreements to make Athlon 64 systems because they didn't want to risk angering Intel.

Intel declined to comment. Of course, the lack of support wouldn't have anything to do with the fact there's no proof of consumer demand for 64-bit yet, would it?

P2P PLOTTERS

Heard the latest theory about why Hollywood copyright owners want controversial file-swapping service Kazaa dead and buried? According to the group behind Kazaa, the anti-P2P campaign isn't just about protecting

artists' rights. In a recent lawsuit, it alleges "conspiratorial" activity by record labels and movie studios to drive Kazaa out of business and give themselves a monopoly on digital media distribution.

The company claims that Hollywood's goal is to "limit the means for future digital distribution of either music or major theatrical works in a way that [means] the [studios and record labels] can in the future more directly control the relevant markets".

So there.

SPAM SCAMS

Australia's new anti-spam legislation may have a hard time stopping anything if rumours of "spam-friendly" ISPs prove to be true. It has been said that two unnamed Australian ISPs are accepting bribes to allow their servers to be used as open relays for bulk spammers.

It's true that bulk spammers have targeted large networks, including Telstra, but this is the result of unsecured customer email accounts, not dodgy deals in smoke-filled back rooms.

APC first heard the claim from the chief executive of Australia's Internet Industry Association, Peter Coroneos. When pressed, he



► **It's a conspiracy:** "Pssst, heard the one about..."

was unable to provide any evidence. Pity the ISP that ever gets caught.

HIDDEN AGENDA?

Warning bells tolled earlier this year when Microsoft announced it was signing a Unix licensing deal with SCO, the arch-nemesis of Linux fans everywhere.

Obviously the Redmond deal was to support SCO's push to earn licensing rights from Unix, but open source geeks saw other motives. In their eyes, the move was part of a combined effort to derail increasing interest in open source by painting the software as legally suspect. Surely Microsoft wouldn't stoop that low.

William Maher

Data Dump

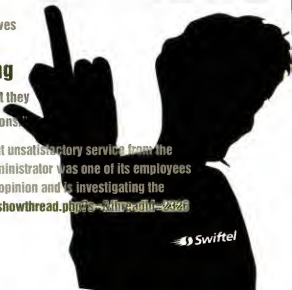
Samsung's memory chip revenue 2002:	Projected 2004 memory chip revenue:
US\$6.98 billion	US\$10 billion (Source: Samsung)
Symantec's income from security products in Q2 2002:	Income for Q2 2003:
US\$52 million	US\$83 million
Proposed pay increase for Telstra directors (from 2004):	Telstra jobs cut in last 3.5 years:
15%	11,243 (Source: Computer Daily News)
Optus' loss in first half 2002-2003:	First half profit 2003-2004:
\$76 million	\$190 million (Source: Yahoo!, Optus)

\$66 million

Sales from Coles Myer's "emerging businesses" unit, which includes online operations Coles Online and Shopfast. Online sales were up 17% from Q1 2003 sales of \$56 million.

"... Swiftel has manipulated these **losers** so that they waste their lives promoting the **Swiftel ADSL service** at no cost to Swiftel. Swiftel would not be where it is today without the **unwitting help of those idiots** who were so stupid as to not realise that they were **being manipulated** into doing the reverse of their intentions."

Swiftel forum administrator talking about customers who spoke out about unsatisfactory service from the company. Swiftel network manager John Linton confirmed the forum administrator was one of its employees and said it was a well articulated point. CEO Chris Gale has sought legal opinion and is investigating the culprit after APC brought it to his attention. <http://forum.swiftel.com.au/showthread.php?p=14444>



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Spick and spam

Telstra has copped it from all directions over spam-driven email delays, but who's really clean? And who's likely to stay that way? Dan Warne puts eight other prominent ISPs on the spot.

When Telstra's mail servers started crumbling in the first week of October over 1.6 million BigPond customers found themselves without an email service. The disaster provided a golden opportunity for marketers at other ISPs to strike while the iron of customer discontent was hot.

OptusNet started promoting itself as "reliable internet"; TPG cooled off on its super-cheap broadband deals to push free spam and virus filters; and AOL found time to talk to the media about how it had been able to block billions of junk emails, allowing real messages to get through to members unimpeded.

Even BigPond found an opportunity to make something out of its own misfortune when it signed thousands of customers to a free three-month trial of its spam filtering service, presumably in the hope that they would shell out the monthly fee after the trial expired — or lose their spam protection.

But online forums held an air of scepticism. BigPond had evidently under-resourced its mail servers and left its run too late with spam protection, but were the other ISPs any better? Was it only a matter of time until the next big ISP went down?

APC quizzed eight of Australia's high-profile ISPs about their capacity to deal with the next big surge of spam and virus-generated email.

AOL: BILLIONS OF SPAM A DAY

AOL7 may be a minnow on the Australian ISP landscape, but it uses the same mail infrastructure as its giant US parent, AOL, which has 35 million users worldwide.

Rather than relying solely on email content analysis, AOL clamps down on the techniques used to send spam, implementing a raft of tough technical rules on its mail servers to keep rogue spammers out. It now bounces two billion spam emails a day and delivers 400–600 million legitimate emails daily to customers.

The proprietary spam-blocking techniques include dynamically blocking mail servers which try to deliver mail to a large number of non-existent users (a "dictionary attack"), and also blocking servers which use fake "from" addresses and subsequently reject bounce notifications sent by AOL. AOL also disconnects

anyone sending mail directly from a residential Internet connection — that is, running a mail server on a dynamic IP address.

Even the Internet Industry Association's Peter Coroneos, a long-time advocate of educating consumers rather than forcing ISPs to control the spam problem, concedes that if large ISPs like AOL didn't have effective spam filtering strategies, their networks could simply collapse under the weight of junk email.

IINET: RESISTANCE IS FUTILE

iInet, jokingly referred to in the industry as "iBorg" for its track record in "assimilating" smaller ISPs, won't say how many customers it has, but claims to operate 168,000 mailboxes sending and receiving 6 million emails a day.

"For really short bursts from spammers, we can absorb an extra 100–200% with no loss of mail, but some delays," says iInet's chief technology officer Greg Bader. "For general increase in volume, we are looking at 15%, and after this we simply add more hardware. The system is designed to be easily upgraded."

BigPond had evidently under-resourced its mail servers. . . but were the other ISPs any better?

Bader says although this seems like a small amount of headroom (redundant capacity), iInet keeps mail volumes steady by using two layers of protection. One system rejects email outright if it's generated by known viruses; another tests incoming mail for common spam signatures such as multiple addresses, common word patterns and bogus sender addresses. If the score exceeds a defined value, the mail is tagged, and customers can filter out email by setting up a rule in their email program.

"All this does put more CPU load on our servers, but it means our volumes do not increase significantly," he says.

Bader is redesigning iInet's mail system to handle up to 500,000 accounts, with more flexible virus and spam filtering. Currently, iInet runs Linux and qMail on IBM servers.

Approximately 50% of iInet's incoming email is spam, and the ISP estimates that even with its barriers in place, one in five junk emails slip through.



INTERNODE: SMOOTH SAILING

Internode didn't even feel a bump as it piloted its way through the period when BigPond's mail servers were crashing, according to John Lindsay.

Even with always-on ADSL customers outnumbering dialup users by two to one, its mail servers, which use SurgeMail on FreeBSD, run at only 20% of total capacity, he says.

The SmitSpam server software running on Internode's mail servers applies a spam-

likelihood rating to every email on a scale of zero to 10. Users can then set a threshold for delivery, below which emails are held at Internode for later review. Network operations staff stop spammers at its network's edge by manually monitoring traffic for servers sending large volumes of mail.

"It has taken an amazing amount of time to find a solution that works really well," Lindsay concedes. Earlier systems worked well in lab testing, but failed under real-life traffic load.

"It is interesting that the [BigPond] problems coincided with Telstra announcing a new spam filtering system," Lindsay says.

IPRIMUS: PROTECTION MONEY

One of the country's largest ISPs, iPrimus, has 430,000 customers, processes two million emails a day, and plans to introduce antispam filtering. But, as seems to be the rule with providers with large, established customer bases, the service won't be free, but made



available for an additional monthly charge.

The ISP currently has "whole-of-network spam detection which kicks in when spam is at a level at which it could interfere with the normal operation of service". It won't talk about which mail server platform it uses, citing company confidentiality, and says spam will ultimately need to be controlled by regulation and law enforcement.

However, like the majority of the other ISPs APC interviewed, iPrimus says it wasn't affected by the recent Swen worm which Telstra blamed for its problems.

"We are not aware of any ISPs who do not take an interest in managing spam," says iPrimus's Geoff Neate. "It has a direct cost to them in scaling and managing their email environments, so they have a vested interest in the outcomes."

NETSPACE: A SURPRISING REACTION

Not everyone wants spam filtering, according to Netspace's Stuart Marburg. He was surprised by customer reaction when across-the-board spam filtering was introduced.

"Some customers were quite upset because they were concerned that they weren't getting legitimate emails. We removed it for several months, and have now introduced a more configurable per-user system."

Marburg was sceptical of the "Swen explanation" Telstra used to explain its email delays. "I'm certainly not aware of more than a small blip from Swen for us. Our staff would have been discussing it if there was a problem, and there wasn't any discussion internally."

But virus-generated emails do create a huge support problem for ISPs, Marburg says.

"If customers get a virus that sends out vast amounts of email, it affects the speed of their connection, and their perception is that Netspace is broken at the network end. It puts a load on our support staff that wasn't around a few years ago."

Netspace has mail filtering that includes black-listing certain senders, white-listing friends and known senders, and constantly updating RBL block-lists that counter thousands of Internet addresses being used to send spam.

OPTUS: UP TO THE CUSTOMER

Optus doesn't offer configurable per-user spam filtering, as it believes in educating customers and giving them the choice of provider.

"That's not to say we won't be offering spam filtering in the future," says spokesperson Melissa Favero. "But we've already put a great deal of effort into publishing information on our Web site on different options for our users."

"Our issue is, do we force customers to pay for the service as part of their monthly fee, or do we give them choice? We would prefer to help them find a spam-filtering provider and give them the ability to choose."

While this smells suspiciously of PR spin, the proof is in the pudding: Optus was able to head off the Swen attack very successfully.

OZEMAIL: HITTING ROUGH WATER

OzEmail faced email problems itself in November, making the mistake of trying to sell outages to the public as a "system upgrade".

Spokesman Scott Portelli is now cagey about disclosing Ozemail's customer volumes or divulging its mail servers' spare capacity, saying only that "adequate" headroom means its system will continue to deliver, even under exceptional load, though "at the cost of some deterioration of service".

Stating that OzEmail churns through more than five million emails a day, he concedes that recently, "OzEmail experienced increased load on the server... Customers were receiving their mail, but there were delays. Our architecture is tolerant to extreme load peaks and we were not impacted as detrimentally as other ISPs."

He also takes a swipe at Telstra's spam filtering efforts: "We are investigating a number of technologies to provide customers with a robust, supported and effective solution, rather than provide them with third-party software like some other ISPs have done."

OzEmail's new customer registrations jumped 22% in the weeks following the worst of the BigPond outages.

TPG: EVERYTHING A-OK

TPG's greatest spam challenge lies in stuffing its mail servers with enough CPU power to filter

all incoming email at a rapid rate — not that this has posed much of a problem, according to marketing manager Kanina Rowe. She audaciously claims that only 0.5% of spam makes it through TPG's free spam and virus filters, which are blocking about 500,000 junk emails a day. But it's up to customers to choose their own level of mail filtering, she says.

The mid-weight ISP, which has grown rapidly through saturation marketing, has 310,000 customers and handles 2 million emails a day. It recently batted down its mail system with 70% spare capacity.

Swen didn't pose much of a problem, Rowe says, due to TGP's very large headroom and immediate upgrades. **EDGE**

Coping with Spam

How the other ISPs measure up

AOL	
Techniques	Free, very smart network-level protection using rolling analysis of sender behaviour.
Verdict	★★★★☆
iNet	
Techniques	Free, user-configurable mail filtering based on content analysis.
Verdict	★★★★☆
Internode	
Techniques	Free, user-configurable mail filtering based on content analysis.
Verdict	★★★★☆
iPrimus	
Techniques	Free, basic network-level protection blocking known spammers.
Verdict	★★★☆☆
Netspace	
Techniques	Free, user-configurable mail filtering based on content analysis.
Verdict	★★★★☆
OptusNet	
Techniques	Manual monitoring of network traffic and free, basic network-level protection blocking known spammers.
Verdict	★★★☆☆
OzEmail	
Techniques	Free, basic network-level protection blocking known spammers.
Verdict	★★★☆☆
TPG	
Techniques	Free, user-configurable mail filtering based on content analysis.
Verdict	★★★★☆



The big upgrade

To reassert itself in a swelling crowd of electronic gadgets, the homely old PC is smartening up its act in 2004. William Maher previews the year our choices broke.

High-tech is about to be cool again. Three years after the dot com crash turned tech dreams into nightmares, Australians are splurging like never before on electronic appliances such as DVD players, wide-screen TVs and digital cameras. At Harvey Norman, for example, demand is the strongest in years, with sales jumping 21% in the September quarter.

Meanwhile, the household PC is having to find new ways to maintain its status. The big trends for 2004 will be flat screens, notebooks, DVD compatibility and "media" PCs. Raw processing grunt is taking a back seat to portability, style and connectivity. Big bulky desktops are out; sleek and small is in.

It's a big turnaround since the PC market faltered in 2000, when sales growth seriously dropped for the first time in years. With faster processor speeds tempting people to hold on to computers for four or five years before upgrading, it seemed our obsession with them

was weakening. A "post-PC era" was predicted in which the computer would take a back seat to digital set-top boxes and consumer electronics.

So far, the dire warnings have been proven wrong. Many people see no real technical need to upgrade their machines, but the Australian consumer PC market continues to grow. Now, wireless networking and notebooks are causing the most excitement, with notebook sales jumping 28% in the third quarter of 2003, compared to the corresponding period in 2002. Sales revenue from notebooks is expected to overtake that from desktops this year.

PC makers have also started eyeing the popularity of accessories such as digital cameras. Canon achieved a record 12% growth in its consumer imaging business in the first half of 2003 on the back of big sales in digital cameras. The company claims

the potential of PC-based photo-editing corresponds with the number of households connected to the Internet (ACNeilsen: 42%).

NEW APPLICATION DRIVERS

The new trends mark a turning point in our reasons for using PCs, says Charles Britton of the Australian Consumer Association. "We could be looking at a period when people go back to an application-driver for PC sales, which the Internet wasn't," he says. "The Internet was a driver of all sorts of other things, but in my view, digital cameras and image processing will really [encourage PC sales]."

Camera sales aren't the only thing changing the way PCs are designed and sold. The market is fragmenting, with new styles, shapes and features for different people.

Perhaps the biggest trend in 2004 will be a push to position the computer as the home entertainment hub (a strategy also tried by Sony with the PlayStation 2).

The flagship of this movement is Microsoft's Windows XP Media Center Edition 2004, due in September. A new generation of PCs will come with this OS, plus a remote control for watching and recording TV. Examples include HP's Media Center PC and Acer's Aspire.

Also arriving in 2004 are wireless media adaptors — standalone relay points for streaming audio and video from a PC to a TV or stereo in the lounge room.

Even notebooks are being re-engineered to be more DVD-friendly. Screen sizes are expanding, with more 15in products available and widescreen notebooks starting to appear.

Toshiba has plans for a mini home theatre notebook packing an 18in widescreen, DVD recorder and Harmon Kardon sound system. It's not exactly light, but in this new notebook category portability comes second to movie-watching comfort.

"You can still move them around, but they'll tend to sit in that high-density living environment where they'll become the TV replacement," Toshiba's Mark Whittard says.

Many whitebox makers say they're also planning lounge room-inspired PCs in 2004, though not necessarily using Microsoft's Media Center OS.

Bluechip and Altech both have mini-systems designed to be integrated into a home theatre environment, with stereo-inspired features like one-touch jog dials. Dell reports requests from customers for "legacy-free" systems without floppy drives.

SHRINKING ARCHITECTURE

Even the internal architecture of the PC is being redesigned to aid the smaller-is-better trend. New mini motherboard designs will replace the ageing ATX design in 2004, including VIA's tiny 6.7in-wide motherboard size called Mini-ITX, and another 4.7in design, Nano-ITX. Intel also has the new BTX design, allowing tightly integrated systems to handle heat reduction more efficiently by positioning processor, chipset and graphics card for more effective airflow.

Elsewhere, fast gaming systems are rapidly becoming a separate segment. AMD is planning no less than four different upgrades to its 64-bit CPU powerhouse this year, including a cheaper version codenamed Newcastle and a 90-nanometre model dubbed Winchester. By mid-year Microsoft says it will release a 64-bit version of Windows XP. Meanwhile, the next version of the Pentium 4, dubbed Prescott, will also debut at 3.4GHz, supplementing Intel's already-released Pentium 4 Extreme Edition. By year's end the speed barrier may well have broken 4GHz.

At the same time, notebooks are taking over as the platform of choice at work and at home. The technical gap between

notebooks and desktops is disappearing, and this year will bring better battery life, screen quality, audio and wireless networking. New chips include the Dothan Pentium M processor, and the second half of the year will see an upgrade to Centrino called Sonoma that includes PCI Express for much faster removable PC card devices, and Serial ATA for high-speed hard drive connections. Wireless networking will also improve with 802.11g support.

The varieties of notebooks available are also increasing, with desktop-replacement models sitting alongside ultra-portables and widescreen machines. "We're seeing a divergence in form factors. A large-screen market is starting to grow," says Toshiba's Whittard. Flat screens for the desktop are also becoming standard, being sold with 70% of HP's machines.

So far, the new features are paying off. "The PC market is probably at its healthiest since the boom of the pre-Y2K years," Gartner analyst Andy Woo told *Computer Daily News*. "Vendors continue to push mobile PC as the alternative platform, while end users are embracing mobile

PCs in a big way. We expect the mobile trend to continue [in 2004]."

Local PC wholesaler Impact has increased the number of machines it supplies to retailers by 20% since mid-2003 (to 1,000 a month), and expects that to jump a further 20% this year. Big-name vendors also predict a big year: HP targets an ambitious 35-40% growth in its notebook business, and 10% in desktop PCs.

"I've been looking at this market for about three years and this is the first time I've seen Christmas actually happening," says HP's consumer business manager Vickram Bedi in late 2003. "A lot of people have old equipment to upgrade, and consumers are more confident on the back of the strong economy."

HARDER TO PLEASE

But it's still a tough fight to stay relevant in a market where tech tastes are now with DVD movies and interactive entertainment. Ross Peacock of Marvel Computers says not all PC manufacturers have had a good year. "It's been very, very quiet. It hasn't picked up."

People are getting harder to please, he says, especially in relation to price. Consumer desktop PC prices dropped 12% from the first to

second quarters of 2003, and are expected to continue dropping in 2004. Whiteboxes, or PCs sold by local vendors, have often represented the best value, but now they're under pressure from cheap deals from Dell and other big brands.

"The computer market is funny," says Peacock. "If I've quoted someone \$5 too much for a hard drive, they'll get in a huff about it and spend three hours driving somewhere else to get it \$5 cheaper."

Whittard says prices have fallen so much, it's become a game of survival for vendors. "You can't make money selling PCs in Australia. You have to sell about 150,000 a year just to break even."

As PCs increasingly become commodities, like DVD players and TVs, competition is tipped to drive prices down even further. Even a \$50 difference can benefit one brand over another.

"A lot of people are probably buying their second or third computer and they're more tech-savvy about buying hardware," says IDC's Imraan Ali. "It's bargain-hunter time. Basically, the customer is king now." www.pcworld.com

Brand new!

64-bit: upgrades to AMD Athlon 64 CPU.



Desktop: Intel Prescott (3.4GHz, extra multimedia instructions); AMD Paris (Athlon upgrade).

Mobiles: "Dothan" Pentium M processor; "Sonoma" Centrino upgrade (802.11a/b/g, PCI Express, Serial ATA).



Media PCs: with remote control and Microsoft Windows XP Media Center Edition 2004.



17in flat screens: standard on desktops.



Form factors: VIA Mini-ITX mobo; Intel BTX design for better airflow.

DVD: CD-RW/DVD combo drives standard.



Opt-in laws spam's knockout punch

With its cost to the online economy growing, governments worldwide are starting to legislate to stem the deluge of unwanted emails. But legislation will only be effective if the laws focus on the "opt-in" option.

After a long wait governments of the world are finally starting to pass real antis spam legislation. As of last month, all European Union countries have banned unsolicited direct marketing by email. Korea — a notable source of spam for the past two years — is moving towards adopting similar laws, and while the US Congress is caught up in its usual battles, it should be passing some type of antis spam law this year.

Our Federal Parliament will introduce a bill in September. It's been passed by the House of Representatives and, at time of publication, was due for full Senate consideration. Many other countries are now looking into taking similar legislative action.

At CAUBE, when we talk about "spam" we refer to electronic mail that has been sent to a large number of recipients who haven't explicitly requested it. As email is cheap to send, there's no natural control on the number of messages transmitted, making it difficult to slow the flood of communications being blasted out to millions — in some cases billions — of email addresses.

When we talk about real antis spam laws, we mean laws of the "opt-in" variety. Opt-in means the sender must have the recipient's permission before sending unsolicited email. The alternative — "opt-out" laws — won't reduce spam, as these allow anyone to send you messages until you tell them to stop.

The problem with opt-out is that even if a tiny portion of the hundreds of millions of businesses around the globe sent you spam, you would receive so much that you couldn't possibly have

most commercial email that isn't sent in bulk will still be allowed. The effect of this is that the Bill bans "unsolicited bulk commercial email". This compromise is acceptable.

The vast majority of spam is in the banned category. The proposed law will shut down both the major Australian spammers and a variety of small-time operations, applying fines of up to \$1.1 million each day. In addition, local spammers can't escape this by moving their servers or businesses overseas.

There have been suggestions that the proposed law would have a number of undesirable side effects, such as banning email that's not spam, and creating excessive search powers. However, much of this interpretation relies on reading the provisions without considering the legal meaning of the language involved, or failing to take into account the effect of other laws.

CAUBE has analysed these criticisms and have found most don't reflect the true legal impact of the provisions. And, of the remaining side effects, none are bad enough to prevent the law from going through. CAUBE is also working with other organisations, including the International Coalition Against Unsolicited Commercial Email (ICAUCE), to introduce similar laws worldwide.

CAUBE strongly supports the proposed Australian law, but notes that it's only one part of the solution. While nobody believes this law will be the ultimate spam panacea, we know the problem can't be solved without measures such as this.

Over the next few years we expect that there will be less places

The alternative — "opt-out" laws — won't reduce spam, as these allow anyone to send you messages until you tell them to stop

time to reply to each sender asking them to stop.

It's impossible to regain control of your inbox with an opt-out standard, which is why we don't consider opt-out laws to be an effective spam deterrent.

Another problem with the opt-out approach is that it gives a misguided legitimacy to the spam itself, with many of the view that as long as the opt-out clause is in place, sending a rash of unsolicited communications is acceptable. This was confirmed by the Korean experience, where the amount of spam sent from that country actually increased upon enactment of opt-out spam legislation, with even large and otherwise reputable organisations getting in on the action.

The Spam Bill 2003, currently making its way through Federal Parliament, will bring, most importantly, an opt-in law. But it doesn't ban "unsolicited bulk email"; rather, it bans "unsolicited commercial email".

The Bill includes measures designed to cut this back so that

for spammers to run to — and once isolated to a few countries, spam will become much easier to filter with solutions like software and blocking lists.

Troy Rollo is the Chairman of CAUBE (the Coalition Against Unsolicited Bulk Email), a non-profit lobby group opposed to email spam, and was involved in recommendations to the Federal Government for the Spam Bill 2003.

This is a rebuttal to last month's Opinion from Electronic Frontiers Australia head Irene Graham, which appeared on page 28. It can also be found online at <http://apcmag.com>.

Next month APC staff writer Dan Warne writes an open letter to Internet providers about what Australians want in a broadband service.



ANOTHER DAY AT THE OFFICE.



Introducing the new LG wireless notebook. It's lightweight, thin and has an extra long battery life made possible by Intel® Centrino™ mobile technology. Now you have the freedom to download files, send e-mails and surf the net wherever you want.



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Telstra must do more in 2004

The telco's performance this year will substantially shape the IT landscape, with wider implications for the OECD ranking and IT trade deficit of Australia — the so-called "knowledge nation"

Arguably just two men have the power to shape Australia's IT scene in 2004. There may be more, but these two wield their power in the biggest IT company in Australia; they can mould this country's Internet landscape as well as set the pace on skills-outsourcing.

And there could hardly be more contentious issues as Australia continues to plummet in OECD rankings for broadband penetration (currently 19th, down from 12th in 2000, with analysts predicting a lowly 40th by 2005).

The recent BigPond email disaster highlighted the appalling lack of planning for future capacity needs at the country's premier ISP, causing disgruntled customers, unable to do business via email, to note that the only thing premium about BigPond was the price.

Then, you've only got to mention outsourcing in IT circles to get techies fired up. Blowing in the breeze of IT's fads and fashion, offshore outsourcing is the "new black" for CIOs as pennies get pinched at the expense of local employment.

Which brings us to the two gents who'll be watched most closely as the year unfolds: BigPond boss Justin Milne and Telstra CIO Jeff Smith. The vision and performance of these two in 2004 will have a lasting impact on the quality of Internet service for millions of Australians, not to mention the country's OECD ranking, IT unemployment levels and IT trade deficit.

By any measure, 2003 was a less than stellar year for Australia's

1.6 million people weren't receiving email, and why the email they sent went nowhere. Dodging like a prizefighter, he blamed Sun and HP, software upgrades and months-old bugs and spam that should have been blitzed at

a network level — and was by other ISPs.

Milne made no mention of the woeful lack of headroom capacity, which shifted between 20 and 35%, depending on his mood, when asked by the media. (To put this in perspective, Pacific Internet maintains 75% headroom to avoid surging traffic problems.)

As for restitution, there was none. Rather, Milne offered to charge users for the same spam and content filtering that comes as standard at ISPs such as Internode and many others.

His most immediate concern for 2004 will be the \$100 million overhaul of Telstra's email infrastructure. This impressive figure was served up by CEO Ziggy Switkowski in response to the disaster that began enveloping the company from September last year. The success or failure of this project will feature in bold print on Milne's 2004 report card.

Telstra's other star attraction is CIO Jeff Smith. His casual yawns produce hurricanes across the local IT landscape, and his 2003 report card is a work in progress.

Dispatch received an outraged letter from Smith in June denouncing as "incorrect and sensationalist" reports that Telstra workers were being sacked in favour of Indian outsourcing

Milne and Smith's vision in 2004 will have a lasting impact for millions. . .

largest telco. Especially the final quarter, which was spent making excuses about email delays. Heading that sideshow was Milne, the man who left OzEmail as CEO in November 2002. His yearly report card at Telstra reads with some rough scores.

There was prime time TV coverage for the perils of its excess usage charges. Suzie Davenport had half her bill of over \$10,000 refunded, but she now catches the bus instead of driving her car because a rogue file-sharing program exploited her ignorance. For its part, Telstra did no more than send a series of emails to alert her that her \$60 account was heading into five figures.

Samara Eisenhuth chalked up \$20,000 in debts due to the same problem. These billing blowouts are tied to the odious policy of charging for uploads — a fact that might not be immediately appreciated by punters wooed by saturation marketing.

Few other companies charge for uploads; the industry standard is to only charge for downloads. You can understand Milne's reasoning, though. BigPond reaps up to \$50 million a year from people like Davenport and Eisenhuth.

But this hurdle seemed like a speed bump compared to what was coming. Milne, oblivious to the pain and cost to his customers spent about four months on a slip'n'slide as he tried to explain why

companies. Four months later he was spouting the virtues of his tremendous cost-cutting exercise. Indian outsourcers Satyam and Infosys were indeed on the books and it was swell to have them there. It's bitter news for Australian workers in an industry suffering record unemployment levels (now upwards of 11%).

It's also bad for our \$17 billion IT trade deficit. The trend towards outsourcing means less investment in local innovation by the biggest user and employer of IT skills in Australia. This holds back locals from exporting smart tech and turning the IT trade deficit into the surplus you'd expect of a "knowledge nation".

Smith then became a self-appointed open source champion. He plans to free Telstra from the shackles of Windows and has launched Project Firefly, a pilot test of 500 desktops running GNOME, Mozilla and Star Office. Project Firefly would re-engineer Telstra's office systems and save them heaps, Smith assured his CFO, David Moffatt.

Meanwhile, CIOs from ANZ Bank, NSW RTA, Virgin Mobile, Grace Removals and others all laughed out loud at Smith's chest thumping. Aside from the silly business of being, er, "evasive" about Indian outsourcers, Smith's report card starts now. This is the year he must back his boisterous bravado with results, or go back to America.

gmontgomery@apcmag.com

ONE MORE POWER FOR SPORT



BEHIND A TINY PRICE TAG, THE 1.8 LITRE COROLLA PACKS A WHOLE LOT OF POWER. 100kW OF POWER FROM A TWIN CAM, MULTI-VALVE ENGINE, WHICH ALLOWS IT TO DO 0-100 kph IN 9.1* SECONDS. AND BECAUSE IT'S ALL ALLOY, IT'S SURPRISINGLY LIGHTWEIGHT, WHILE OUR VVT-i TECHNOLOGY MEANS IT'S VERY EASY ON THE FUEL CONSUMPTION. AND IF THESE AREN'T POWERFUL ENOUGH REASONS TO GET ONE, WE'VE ALSO INCLUDED DRIVER'S SRS AIRBAG, SPORTS FRONT SEATS, CD PLAYER, KEYLESS ENTRY AND ENGINE IMMOBILISER. JUST MAKE SURE YOU HOLD ON TIGHT. **COROLLA BY NAME. NOT BY NATURE**

ON WHAT A FEELING!

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*Recommended retail price of Seca Ascent manual model only. Price excludes dealer delivery & statutory charges. Metallic paint and roof racks featured are extra.

*Based on Toyota testing using a 5-speed Seca Ascent manual model under test conditions. TOY7732/APC/SB

Watchdog

Ace(r) in the hole

Tablet PCs: are they all they're cracked up to be? A user says "yes" — but wishes the reasons weren't quite so literal.

I own two Acer Tablet PCs, and while I would generally recommend them to the active road warrior, I've come across a problem that makes me wonder whether Acer has got the ergonomics right.

The inside corner of the screen surround of this four-month-old tablet has cracked as a result of normal opening. The single, central swivelling hinge is quite stiff [so users can] prop the screen open when using it in notebook input mode.

When I open the screen, I tend to hold the computer in my right hand and open the screen by lifting it on the left-hand side (which is free of function buttons). Doing this has cracked the corner of the screen and made the screen itself unstable.

And Acer's response? Because this doesn't usually happen, I must have abused the equipment. Therefore warranty is denied and I'm left to take action through Victoria's Fair Trading

Tribunal for breach of merchantable quality and breach of contract.

It's a pity that no-one at Acer is willing to discuss a consumer complaint, and that legal action is the only remedy.

*Poul Kenna
Bundoora, Vic*

Kenna also supplied a photo of the damaged unit, which doubles as a notebook computer. Watchdog approached Acer with the issue.

Acer is familiar with this particular case. Most certainly the customer has been told that, at first sight, the damage caused to this particular Tablet PC appears to be a direct result of misuse. Acer has offered the customer a full inspection by a senior engineer but unfortunately this offer has been declined. Additionally, we can facilitate an independent inspection at Acer's expense, if at all necessary, prior to any final conclusion being made.



Acer strongly denies any claim or inference that we have simply rejected the customer's warranty claim based on any form of assumption. But since the customer has refused to leave the product with Acer for a more detailed analysis, we have not been able to assist further in resolving this case.

*Neil Roberts
technical services director
Acer Computer Australia*

When Acer's response was relayed to Kenna, he provided a thorough outline of his experiences with the company's warranty service centre, noting that he could have been charged if he'd left the unit at the warranty depot. Kenna told Watchdog that it seems like Acer wishes "to rewrite history". "Their media liaison staff seem to be misrepresenting even what their own service reports state."

Acer is still looking into Kenna's issue. Technical services director Neil Roberts told Watchdog that "Acer will continue to strive

NetComm's Red Hat disconnect

Dear Watchdog,

I have been trying in vain to find drivers for NetComm's NP7042 Wireless LAN USB adaptor for Red Hat 9.0, or even 8.0 or 7.3, basically any version.

I am quite happy to downgrade my entire OS just to get it up and running. This is insane, I know, but I really want to get it working.

The only comment I have is "good on you" for challenging your driver writers!

I can remember the days when I happily recommended NetComm's modems to everyone and anyone — they were brilliant.

It's a shame they can't continue the tradition [by providing adequate support across all products].

*Andrew Eagle
Nerong, Qld*

There are a number of reasons for the lack of driver support we provide for the NP7042 Wireless LAN USB adaptor on a Linux operating system:

1. We receive very few calls from our customers and channel partners for Linux support.
2. Quite often the chipsets used to drive a product don't support a Linux environment.
3. The manufacturers of many chipsets have no intention of writing a generic Linux driver which we can adapt.
4. Market demand doesn't always justify the expense of developing a driver from scratch.

Be that as it may, I have also gone back to the chipset manufacturer, which is Atmel (model number AT76C503A) and questioned them about a Linux driver. Unfortunately, they have indicated that they have no intention of writing a generic Linux driver which we can use as the basis for a NetComm driver.

However, they have pointed me to two URLs which seems to indicate that the open source community has already developed a solution. These URLs are as follows:

<http://ot76c503a.sourceforge.net> and <http://ot76c503a.berlios.de>.

In the future, NetComm will continue, wherever the chipsets allow, to provide either a driver or set-up instructions (whichever is appropriate) so that our customers can utilise our products on the Linux platform.

*Joseph Rou
marketing manager
NetComm Limited*

Contact us

WE WANT TO KNOW

How IT companies are really treating you. Write to: watchdog@apcmag.com or PO Box 4088, Sydney NSW 1028.

Include your full contact details and any product information. All correspondence becomes the property of APC and is subject to editing.

to assist this customer and provide a fair and reasonable resolution. Our technical services manager for Victoria is dealing directly with the customer and every effort will be made to reach a mutually agreeable resolution."

Watchdog will present the final outcome of this matter in APC's February issue.

Dear Watchdog,

I bought a stick of, supposedly, Kingmax RAM from GameDude Computers in Brisbane, having selected it and other parts from GameDude's Web site the day before.

A couple of weeks later, troubles began to arise. A blue screen with "Hardware malfunction" would appear when I turned the computer on, just before the logon appeared. This would happen four or five times before entering into Windows, and while in Windows itself.

My father took the whole computer back to GameDude for them to test. The technician told him that the RAM we'd bought wasn't Kingmax, and that if it had been, the company would have been able to sort the problem out.

We took the RAM out and had a look at it and saw no Kingmax markings on it. This was strange as we'd definitely bought Kingmax RAM, and it also came in a Kingmax package. We looked at the docket and there was no sign of a brand name for the RAM.

My father then called Kingmax and asked what their RAM looks like in order to compare it and they sent us a picture from their Web site. The RAM that we have looks nothing like it, with just a sticker telling us that it is DDR 333 2700. Kingmax has its name printed on every chip.

SiSandra 2003 Pro was used to query my system about the RAM, and it was as generic as generic can be. The RAM also played up in all the computers we tested it out on.

*Elek Sawicki
Brisbane, Qld*

Elek Sawicki's story was forwarded to GameDude Computers for comment.

The dog pound

2003 definitely won't go down in IT history as the year of customer service excellence. Watchdog has trawled through reader feedback for the year's lowlights, finding a trio of runaway winners.

The number of complaints wasn't the only thing that made these companies stand out. Inflexibility, incompetence, or just plain indifference in dealing with customers truly sets these outfits apart.

Policy pedants: Quicken

As far as publicity nightmares go, Quicken's re-registration gaffe must rank at the top of any list. CEO Greg Wilkinson told APC in June that an automated online solution would result in a "huge increase in piracy". The only alternative was for the company to devote Quicken staff to the task of processing "350-400 re-registrations a week".

Abundant numbers of APC readers let Watchdog know what they thought of the practice. Despite repeated entreaties from the press and Quicken's users, the company stands firm.

Wilkinson estimates the re-registration numbers at 350-400 per week. At \$9 a pop, that means the company typically receives less than \$4,000 each week from the policy. The question Watchdog and many disgruntled users ask: is it worth it?

Customer service catastrophe: GameDude Computers

Watchdog doesn't go after the small guys unless they've really gone astray, but

As a hobbyist computer store we rely on our customers knowing what they want and need. We identify all products as they are handed over the counter to the customer before leaving. Our invoices currently state quite clearly that goods must be installed by professionals and any errors with goods sold must be settled immediately.

I have no direct knowledge of this problem nor do I know how long the customer took to return the goods, but I can say that if the goods returned are used or [old], then we do not always accept them back.

It is the customer's responsibility to ensure the goods are correct and are exactly what they asked for prior to

Brisbane's GameDude Computers is hard to ignore. The store made a name for itself both online and in APC's August issue for its "guilty until proven innocent" returns policy.

The company made an ill-advised attempt to gauge customer opinion by requesting feedback on three major online communities: Whirlpool, Overclockers Australia and Ausgamers. A torrent of criticism from the store's clientele resulted. Rather than listen to the opinions it had actively solicited from its customers, the shop's staff made the bizarre move to publicly abuse them when they didn't like the feedback.

We suggest to GameDude that while the customer may not always be right, they're the ones keeping you in business.

Network nightmare: Telstra

Justin Milne enjoyed a brief but glorious honeymoon period heading up BigPond. He did the usual press rounds and unleashed his charms on the broadband site Whirlpool, leading to speculation that maybe Australia's largest ISP was getting its act together.

Then news came to light of Telstra ADSL applicants being given preference over those from other ISPs. Resentment was just dying down when Telstra's email servers underwent meltdown, with massive delays experienced across the network. Most recently, the spotlight has shifted to Telstra's billing practices for users who exceed their download allowance.

Memo to Telstra: get more chewy and sticky tape — your act just fell apart.

leaving. If either the incorrect goods are handed over, or the incorrect product is bought, then it must be returned immediately unused. Many products we buy are OEM or have no box and as such we reuse older packaging.

It is my feeling that the customer asked for some RAM and did not specify a brand, and assumed that because the plastic shell said "Kingmax" that this is what they got. We also re-use Kingston and Corsair boxes, but at no stage do we sell one product as another. We do not sell "generic" RAM, we only sell brand-label memory with a supporting Web site.

*Dorian Bussenius
GameDude Computers*

Need to Know Epinions

P2P users: pay your own way

I was angered to read the "ISPs slammed over billing" article (APC November 2003, page 15). It quotes Suzie Davenport of Victoria, who left her P2P program running, racked up \$10,000 in Telstra BigPond bills, and only repaid half.

Now, I love bagging Telstra as much as the next guy. But was it Telstra's P2P program at fault? And how do you get away with the "I didn't know" argument? The next time you get pulled over for speeding, just tell the policeman that "you didn't know the speed limit" and I'm sure they'll let you off paying only half the fine.

I'm sure the only reason Telstra decided to halve the payment was due to publicity. If we have hundreds of these "I didn't know" users racking up huge bills and not paying them, you know who will eventually pick up the tab.

Shay Hancox
Brisbane, Qld

QUALITY IT TRAINING

My son is currently completing a course at the local TAFE. He recently came home with a bemused look and related the afternoon's discussion. The head teacher of the computing section at this particular TAFE had been talking about recent viruses and explained that the entire network would have to be shut down over the weekend so the computers could cool down completely: "It's no good just turning them off because they're still warm — the virus can survive if the hard drives are still warm."

My son tried to question this with some elementary logic but she assured him it was true.

If this is the quality of teaching at TAFE colleges, what hope do we have? I'm in the middle of designing a new course on Feng Shui techniques as they relate to computer design. I have a feeling this teacher will go for it — hook, line and sinker.

Paul Mailath
Lake Munmorrah, NSW

The computer virus as a biological entity? The ramifications are mind-boggling! Submit your example of training-room genius to epinions@apcmag.com. The best will be published — unless all APC's staff are off work with a nasty bout of Klez.

OF MEGAPIXELS AND MEN

Is buying the latest 4-megapixel and above



digital camera just a waste of the average consumer's money when all they are printing is (mostly) 8 x 10in or less? When I bought my second digital camera two years ago, I knew that at 3 megapixels it had more than sufficient resolution for me to print beautiful 4 x 6 photo cards. I know the 3-megapixel can print as large as 8 x 10, which I rarely do. So when my neighbour showed me his latest Sony 5-megapixel camera — and the stacks of 4 x 6in photos — I couldn't bear to tell him he's only using maybe 25% of the camera's true capturing and output capabilities.

Am I way off-base on this topic, or is the digital camera industry trying to dupe the average Joe into buying the latest models with all the extra megapixels we don't need? Either that, or I haven't found the pleasure or the practical usage of printing pictures larger than 8 x 10in. Are those cameras suited for professionals only?

I guess I can draw the same analogy with PCs and notebooks. The "latest and greatest" are usually geared towards hardcore gamers and professionals. Other than buying brand names for reliability, I can usually save money by buying only what I need, or what I think I may need in the years to come.

Suri Tanzil
Canning Vale, WA

Patrick Kirsch, APC's Art Director and photo guru responds: "The price of digital cameras is dropping

Letter of the month

After reading your article regarding ISPs "overcharging" (APC November, page 15) and similar stories elsewhere, it's apparent that some individuals do have genuine problems. However, the last section of your article raises an insidious problem that is becoming more prevalent in our society. In the text, a Telstra representative indicated that Telstra advises customers via email when they reach 50, 80 and 100% of their usage marks. According to your article, a Telstra customer "angrily disagreed that the warning emails are adequate protection".

I have a problem with this. My ISP doesn't send out any warning and relies on the intelligence of the customer to manage their own affairs in relation to usage. An ISP that issues three warnings would seem to be offering a reasonable level of advice for its customers. If the customer fails to heed the notices, they either are fully aware that extra charges will be billed or they are not capable of managing this type of agreement. There is a growing sentiment that seeks to absolve people of the responsibility for their actions.

While society is becoming more complex, I don't believe that we need to reduce everyone to mediocrity by removing freedom of choice. If three warnings for usage are not enough, I despair at what is.

Nigel Quayle
Port Moresby, Papua New Guinea

Nigel's thoughts on personal responsibility are pertinent. As consumers, shouldn't we always "read the fine print" and be aware of the commitments we enter into?

Nigel's submission has won our Letter of the month prize, Logitech's Cordless MX Duo. Valued at \$229.95, it's ideal for jotting down those views on social order... without being tied to a PC.



while their features/resolution are increasing. Today there are 5-megapixel cameras for under \$800, and semi-pro cameras with 6 megapixels+ for under \$2,000. If you can afford the resolution, buy it — you'll probably need it later."

BUSINESS OVERREACTING TO PIRACY

Recently, a new strain of CD protection has hit consumers, allowing only the computer-savvy to create backups for much-loved programs. Even then we must resort to cracks and patches that, for all we know, could be a virus.

Many programs now have elaborate codes that prevent the original from being copied. This nullifies the original concept of the CD burner as a backup for your system and programs. With no security beyond a 12- or even six-month warranty, and with CDs being extremely vulnerable to scratches and data loss, consumers are often unwilling to burn a copy for fear of copyright infringement.

As the laws regarding copying are unclear to the average user, the Government should clearly define them so that relevant legislation can be included with every burner sold.

Sam Kent
Numurkah, Vic

It should be noted that many software companies are willing to replace scratched or broken CDs for a nominal fee, if proof of purchase is provided. And as much as product activation and anti-piracy measures aggravate us all, industry bodies argue that there's justification behind them. ACNielsen research found that half of all Australians surveyed would accept free goods that they knew to be pirated. These were among a raft of damaging statistics reported in the "Cost of Counterfeiting" study, commissioned by the Business Software Association of Australia.

BROADBAND BENEFITS US ALL

Why is the new Minister for Communications, Information Technology and the Arts Daryl Williams playing down the importance of

diversifying the supply of broadband by referring to the rationalisation of broadband suppliers currently taking place in Korea? Governments and operators in countries such as the UK, Korea, China, Sweden, Iceland, Taiwan, Singapore and Hong Kong all echoed the view that broadband deployment equals economic benefits. So, why wasn't our minister in Geneva to listen to the Chinese Minister for Communications, the King of Spain and many others who advocated the economic advantages of broadband?

Countries leading the push for broadband are now reaping the initial economic benefits, worth approximately 30–40% of the actual spend on infrastructure. Over the course of a decade this could grow to 80% per annum, far outweighing the initial investment.

Benefits seen in investments as diverse as canals, trains, roads, harbours, airports, and so on, are now manifesting in broadband as companies relocate to offices in areas with coverage. Globally, data and call centres are doing the same. At the same time, hundreds of new content-based companies have sprung up in those countries leading this push. These companies will be leading exporters in this new broadband-based economy, and it is frustrating to see Australia missing out.

What happened with the report of the Broadband Advisory Group (BAG)? Bits were taken onboard in the implementation of the Estens Inquiry, but where is the cohesive broadband approach? Where are the policies and strategies, and how are we going to develop a cohesive nationwide infrastructure?

Apparently an implementation group has been formed, but has excelled only in making sure nobody knows about it. Implementation so far is appalling, with the Higher Bandwidth Incentive Scheme (HIBIS) failing to work towards delivering new broadband infrastructure and the consequent demand-aggregation most probably ending up lost in bureaucracy, and the money either wasted, or in Telstra's pockets.

Wouldn't it be much better to learn from the past and anticipate developments in infrastructure-building? Broadband is unstoppable. Ignorance, driven by the desire to privatise Telstra, is blinding the Federal Government and making it impossible for incumbent telcos to see the bigger picture.

Paul Budde
independent telecommunications analyst
Bucketty, NSW

Agenda:

your place to vent

I refer to an email sent by Bigpond accounts blaming its mail server's problem on the Swen virus. What a lot of twaddle!

As a Bigpond customer I receive email that, at times, is up to a week old. Even mail I send sometimes goes through a time warp for several days. And my biggest problem is gaining authentication to the mail server, which has nothing to do with the volume of virus traffic.

Now that I have a new account with a competitor it's become obvious through bounced Bigpond mail that it can't handle the concurrent connections. In other words, its server has nowhere near enough capacity for a service with 1 million subscribers.

Why did Telstra's tech support people and Web site initially blame a bungled upgrade for the problems? How can you blame Swen when all the other mass-mailer viruses like Klez, Magistr and Blaster had no effect?

If Telstra and all other ISPs offered free spam and virus filters on their gateways, the whole world would benefit with faster Web services and (almost) virus- and spam-free email.

My point? ISPs have a lot to answer for when they continue to allow the transmission of destructive code. No virus filter is perfect, but these ISPs can surely do a lot better at the server level than they are now.

Richard Leahy
Roma, Qld

Prize Pit

The lucky winner of our November subscriptions competition is H Gomez of Kallangur, Qld. He has won a Minolta DiMAGE 7Hi digital camera with a 5600 HS flash, valued at over \$3,600.



Have your say

Follow or add to these discussion threads at www.apcmag.com/epinions or email your views to

epinions@apcmag.com.

All correspondence becomes the property of APC and is subject to editing. Letters sent to epinions@apcmag.com must include the writer's full name, suburb and phone number, to be considered for print publication and in the running for Letter of the Month prizes. Phone details will not be published.

Double-capacity DVD

Hollywood execs are no doubt biting their manicured nails over the imminent introduction of a new home-recordable DVD format with an 8.5GB capacity — easily enough to duplicate studio-produced DVDs.

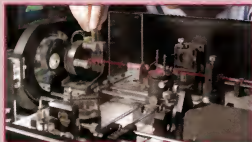
The new DVD+R DL format (the DL stands for "double-layer") is slated for an April release by the DVD+R Alliance. It uses two layers of recording dye to store nearly twice the capacity of a standard 4.7GB disc — enough for 16 hours of VHS-quality video, or four hours at DVD-quality.

Electronics giants Philips and Pioneer and media specialist Verbatim, who are partners in the technology, promise the drives will initially write at a 2.4x speed. Shipments are expected to quickly overtake traditional single-layer drives.

Dual-layer technology has always been part of the DVD specification: according to standards, up to four layers can be included on a single disc (two layers on each side). However to date, no manufacturer has successfully produced a recordable disc with two layers.

Meanwhile, Philips has cooked up a super-fast 16x DVD+R drive. The speed boost of the prototype unit is largely attributed to a simplified tracking system which allows burning operations to stay in sync with the host machine.

Philips has been quick to brag that it's almost at the current limit of DVD-ripping — any faster speeds will skirt what the company is calling "the ultimate limit." Such is the amount of energy being put into the media when spun at 16x speeds, it says, that current polycarbonate-based DVD+R blanks can't go much faster without vibrating themselves into a thousand pieces.



► The ultimate limit: no vibes are good vibes.

Dell sprints into print

The company that helped turn the PC into a commodity (and continues to turn a mighty profit from the exercise) has turned a new page by entering the printer market. Dell's first offerings are the P1500 personal laser printer (reviewed on page 44) and the multifunction all-in-one A940. Both are rebadged Lexmark models.

The \$199 A940 is an ink-based printer, scanner, copier and fax, with colour and mono output. Print quality

Continued under gatefold ►

Roll the dice

As the small form factor PC market continues to grow, Abit has released its own unique take on the mini PC. The DigiDice is built on the Intel 865G chipset and features support for Pentium 4 processors and up to 2GB of RAM.

Unlike the Shuttle designs, it makes space for two 3.5in hard disks and two 5.25in drives. As is expected from anything Abit, the DigiDice delights in a range of overclocking functions, including Abit's SoftMenu BIOS-tweaking utility, along with PCI and AGP slots and RAID compatibility.

It also features Abit's Mini-OTES thermal solution, which helps keep internal system temperatures down — a vital consideration in a mini PC. Other cool specs include one-button CD duplication and a front-mounted LCD panel for keeping an eye on system temperature and status.

The DigiDice retails for \$493.90 and is available from Altech (www.altech.com.au).



*nix

SCO is set to widen its legal action to encompass BSD early this year. BSD, or Berkeley Software Design, has a foundation in open source Unix. SCO CEO Darl McBride stated, "With our limited energies and what our guys are going through, we probably won't file any suits against BSD until sometime in the first half of [2004]."

Queensland University of Technology is currently running the Adios Project, a scheme that allows students a taste of personal responsibility for their OS. "Providing students with administrative privileges has aided students to be more responsible and more ethical in their behaviour," states the project's Web site. Coupled with the project is the Red Hat 8.0-based Adios Bootable Linux distro. For more information on the project, or to obtain the latest build of the OS, go to the Adios Web site at <http://dc.qut.edu.au/adios>.



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ranges from a "quick print" resolution of 600 x 300 dpi, through to photo-quality 4,800 x 1,200dpi, rated at a maximum 17 mono pages per minute or 12 in colour. We'll have a full review of the A940 next month.

Nano nano

No, it's not the latest robotic vacuum cleaner or a Sony AIBO doing contortions. It's Belkin's just-released Nostromo SpeedPad N52, which apparently has 108 programmable functions for die-hard fraggers (www.belkin.com.au).

While we're dubious about Belkin's claim that the gamepad allows users to "carve your reaction time to nanoseconds," the Nostromo does have some potentially useful features, like a directional pad with eight instant kill views.

However, unless you're a hard-core peripheral fan, \$80 seems a bit much for what can be done perfectly well with a keyboard and mouse.



► **Killer view:** Nostromo offers eight instant kill views.

Kazaa Revolutions

Hoping that the "R" word won't do for them what it did for the concluding chapter of the *Matrix* trilogy, Kazaa (www.kazaa.com) is in the throes of a battle for the hearts and minds of users. With the slogan "Join the Revolution," Kazaa's owner Sharman Networks recently launched a US\$1 million ad campaign targeting Australia, the US and the UK. As well as increasing awareness of peer-to-peer issues, the campaign comes on the tails of Kazaa v2.6's release.

The all-new version comes packed with new features, including "Kapsules," a packaged approach to media content. When users download a media "Kapsule" — licensed, of course — extra material such as lyrics, interviews and so on are packed in. Other significant additions include one-click downloading, topical channels and previews of paid content. Underpinning this shift towards commercialism is what Sharman head Nikki Hemming claims is the largest implementation yet of Microsoft's digital rights management (DRM) technology.

Of interest to Web developers is the ability to integrate clickthrough links to Kazaa products on their sites. These "magnet links" are bound to be popular amongst vendors wanting to tap into Kazaa's user base.

Gee whiz

Let's face it — for sharing even the fastest ADSL connection, Wi-Fi is fast enough. The peak 11Mbit/s rate of 802.11b (even at 5.5Mbit/s each way) easily outstrips the data feed from a top-rate 1.5Mbit/s ADSL pipe. So why would you want an ADSL modem outfitted with an even faster 802.11g wireless router? Local networking, in-house gaming and playing

media files streamed from a central server are three good reasons.

So while Billion's new 7500WG combo ADSL modem/wireless router — the "g-rated" update for the much-praised model 743 — isn't a must-have for the broadband set, it's still worth looking at if you want a single box that does it all for an affordable \$369. We'll have a full review next month, but if you can't wait head to www.billion.com.au for more details.

Big iMac

Apple continues to fire shots at Wintel, perhaps in efforts to give potential "switchers" a merry Mac-Christmas. In November it was an engine overhaul for the iBook from G3 to G4 processor, and a price cut for the desktop eMac — down to \$1,349. Now they've bolted a 20in widescreen LCD panel onto the iMac. The base specs remain the same as the 17in model (1.25GHz PowerPC G4 CPU, 80GB hard drive, combo CD/DVD burning SuperDrive, 64MB Nvidia GeForce FX 5200 Ultra, and so on), so the only other thing that's changed is the price tag. How does \$3,898 sound? Head to www.apple.com.au for more information.

Play-anywhere PlayStation

More details of Sony's next-gen handheld gaming unit are becoming available. While the hardware design of the PlayStation Portable has yet to be finalised, the spec-set for this multimedia player looks promising: a 24-bit colour screen for watching MPEG-4 videos, plus Dolby Digital 7.1 output for listening to MP3 and ATRAC tunes on the move. Files will be stored onto a 1.8GB "Universal Media Disc," whatever that means. Sony will release several models in the PSP range, including a top-of-the-line device that supports telephony, and thus wireless gaming, bringing it into direct competition with the Nokia N-Gage.

Rub-a-dub

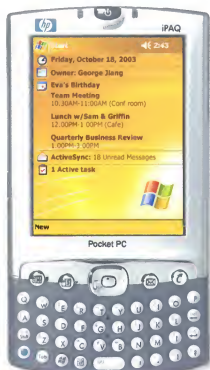
Operating most vibrating rubber objects in an office environment is a recipe for strange looks, if not legal action. But the folk at Anyware are hoping that its USB massage ball might strike a sympathetic nerve with customers. The same crowd that brought you USB coffee warmers and Christmas trees has made the jump to office self-help products.

"Enjoy a firm and invigorating massage at your desk," they promise. And if that isn't a good enough incentive, an extra long cable allows the massage ball to "be used all over your body".

At \$25 it's one of the more inventive uses for a USB slot. Check it out at www.anyware.com.au.



► **USB massager:** takes plug-and-play to a new level.



Double the fun

Hewlett-Packard's latest iPAQ handhelds prove that bigger isn't always better. The iPAQ h4150 crams 802.11b Wi-Fi on top of the integrated Bluetooth receiver and 400MHz Intel XScale processor. Weighing a svelte 132g and sporting the same form factor as the slim h1940, it's the smallest dual wireless device on the market.

The h4350 shares the same specs as the h4150 but bundles an integrated keyboard and a beefier battery. Coupled with the dual wireless capabilities, the h4350 is ideal for email junkies who need to read and reply to messages on the go.

The h4150 retails for \$849 and the h4350 goes for \$949 (www.hp.com.au). For full reviews of both units, turn to next month's issue of APC.

Beta beat

Once upon a time, Microsoft loved it when it went a-wooling. But after the search engine said "I do", it discovered that the monopolist scorned.

Redmond started talking up the mother of all search engines — Microsoft's own. But then, as "pathetic" when compared to the search engines and unavailable vision.

Google's subtle backhanded compliment to the Google Deskbar. It takes the concept a step further by completely removing the browser and planting the search engine centre on the desktop. Integrating the Deskbar allows users to run searches directly in a small, integrated window. The shortcut (Ctrl+Alt+G) for those whose fingers do the talking. Try it out for yourself at <http://toolbar.google.com/desktop>.

That's entertainment

How much fun can you pack into a 5.25in drive slot? Load Gigabyte's Multimedia DVD-ROM GO-M1600A unit and start counting. It plays back conventional audio CDs plus MP3 and CD-RW discs, DVDs and even has an FM tuner.

The unit ships with its own power supply, so the drive can be used while the computer's turned off (although you'll need to turn the machine on to play DVDs, as the device doesn't feature standalone video output).

A remote control and an equaliser with five predefined settings add to the lounge room appeal. So far there's no official word on price, but we'll have that plus a full review in next month's issue of APC.

Head over to www.rectron.com.au for more details.



Fat card

Toshiba's portable PC card has a super-slim 1.8in hard disk inside a PATA form factor, has been generous 5GB. That's the equivalent of a truckload of DivX copies or a truckload of MP3 files. The cost of this diminutive device is \$199 (www.toshiba.com.au).



Two can play

Flash memory-based MP3 players have exploded in the last few years. And while FM radios and integrated voice recorders have become standard inclusions in the current generation of models, Efx Systems' i-MPIA 4000 is the world's first to feature dual inputs so two people can listen at once.

The unit also contains a built-in MP3 encoder to record directly from a microphone, an analogue input, or FM radio to an MP3 file. The i-MPIA 4000 is available from www.efx.com.au starting from \$299 for the 128MB version, and \$399 for the 256MB model.





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Integrated 10/100 LAN – Broadband Internet ready
Ultra AGP II video technology (AGP Bx equivalent for 3D/2D video applications)
Acer 15" LCD monitor
1 year on-site warranty

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RRP inc GST
from \$22.54 per week*
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Integrated IDE controller
2 x Integrated Intel® Gigabit Ethernet controller
52 x CD-ROM
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EXTREME
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SERIES**

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ACDSee will ruthlessly hunt down, catalogue and manage all your digital images.



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DVD-playing programs make it easy to turn your PC or notebook into an entertainment system. *Serdar Yegulalp* screen tests five of the finest.

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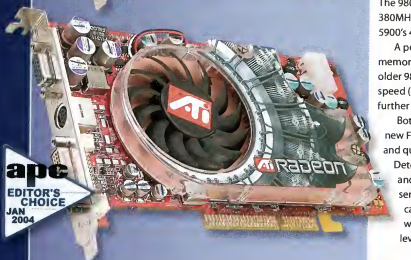


Keyboards and mice

Competition is alive and clicking in the cordless world. *Bill Bennett* compares the devices making desktop cable spaghetti a distant memory.

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► **Big blower:** another Nvidia behemoth cooling solution dwarfs ATI's effort.

STANDING ON THE SHOULDERS OF GIANTS

The current configurations of the 9800XT and FX 5950 Ultra draw heavily from their predecessors. Each attains a new performance high with increased GPU and memory clock speed, rather than through major architectural refinement. The 9800XT's GPU runs at 412MHz, as opposed to the 9800 Pro's 380MHz. Meanwhile, the FX 5950 Ultra hits 475MHz, up from the FX 5900's 450MHz.

A point of difference for the 9800XT lies in its return to using DDR memory, the same type of memory as used in the FX 5950 Ultra. The older 9800 Pro used DDR2 RAM, but the 9800XT's faster memory clock speed (365MHz) isn't stable with the newer RAM. ATI says it will look further into this issue, and will use it if it can make it work.

Both cards benefit from a strong software foundation. Nvidia's new Forceware drivers and screen control software increase speed and quality by a considerable margin—a big improvement over the Detonator drivers which were recently plagued by performance and quality issues. ATI has also steadily improved its Catalyst-series drivers in the last year with frequent updates. With both cards' silicon coming from a mature manufacturing process, it's welcome to note their respective drivers reflecting the same level of sophistication.

MANUFACTURING MIS-STEPS

Given that the core architecture remains largely the same, it comes as no surprise that neither ATI and Nvidia has created a bold new design. In the case of the FX 5950 Ultra, this means most vendors will stick to the reference-designed double-slot form factor. The extra space is necessary to accommodate the elaborate fan/exhaust system. A weighty metal heatsink attached to the front of the card has a leading edge that looks sturdy enough to double as a carry handle. While some vendors may come up with their own cooling solutions, there's no escaping the fact that the card requires a lot of heat dissipation.

If the FX 5950 Ultra's physical appearance is bulky and weighty, the

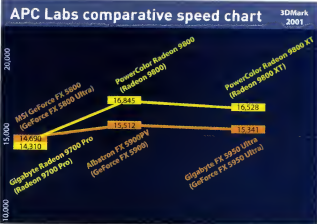
Too hot 2 handle

Justin Kranzl and Jarrod Spiga weigh up which heavyweight's video card triumphed as 2003's best.

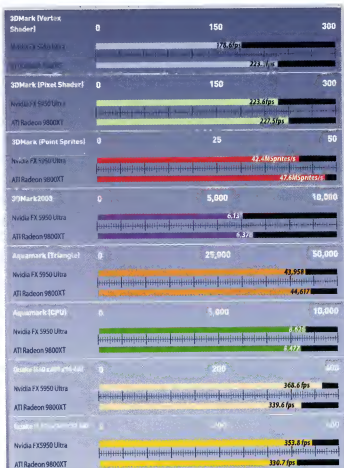
2003 was akin to a year of snakes and ladders for the two leaders in the video card market. ATI consolidated its top spot in the speed stakes by releasing the Radeon 9800 Pro. It also took a stab at the low- to medium-price bracket with the Radeon 9000, 9200 and 9500 series.

Meanwhile, Nvidia had a rough time getting used to second place. It faltered with its intended Radeon 9700-killer, the GeForce FX 5800 Ultra. It tried again with the FX 5900, which was slightly slower than ATI's Radeon 9800 Pro (especially in anti-aliased output) but the gap had been narrowed.

With the margin closer than ever before, each made a final stab at ending the year on top. Nvidia rushed out the GeForce FX 5950 Ultra; ATI, its Radeon 9800XT. Both are faster than the Radeon 9800 Pro, which means pole position is once more up for grabs.



► **Can do better:** Nvidia's FX5950 is edged out by ATI cards in 3DMark2001.



► Struck match: there's little between the two cards in most tests, but the ATI's prowess in anti-aliasing and native DirectX9 execution makes it APC's choice.

9800XT errs toward the other end of the scale. While not taking up two slots, the build quality of the ATI card is dubious: visible solder joints attach the fins to a flimsy-looking heatsink plate. The heating solution features a fragile array of copper fins folded over at a range of different and seemingly random angles.

On the positive side, both cards feature sturdy RAM heat-spreaders on their undersides. The ATI card also includes a longer than standard power cable. Given that both cards require connection to the PC's power supply, it's an inexpensive yet thoughtful move for users who wish to make their PC internals as clutter-free as possible.

32 DEGREES OF SEPARATION

The fact that neither card beats the other across all benchmarks confirms the real competition between the players for the fastest-crown. The FX 5950 Ultra manages a 3DMark2001 score of 15,341 on the APC Labs testbench. Meanwhile, the 9800XT cruises more than 1,000 3DMarks past it to settle at 16,528. In OpenGL applications like Quake 3, the Nvidia card demonstrates plenty of raw polygon-pushing power at low resolutions, recording 368.6fps in 640 x 480 mode with 16-bit colour, well ahead of the ATI's 339.6. But as the resolution and detail level increases, the gap between the two disappears.

The ongoing concern for Nvidia is DirectX9 performance. The FX 5950 Ultra, like other FX cards, has to devote processing cycles to converting or "downsampling" from its native 32-bit colour to DirectX's 24-bit colour standard. The 9800XT doesn't need to do this extra work as it generates visuals at 24-bit color. This radical structural difference gives the ATI card a natural edge in DirectX9 applications. As DirectX9 looks to be a prevailing graphic standard on Windows platforms for some time, it's a key distinction which Nvidia needs to address.

CONSUMER CHOICE

The fact that the cards are so closely balanced is a blessing and a curse for potential buyers. With graphics silicon easily outstripping most applications in performance potential, there are very few users at present who need the power available on tap. While these cards are the fastest on the market, it's not by a huge margin. Cash-conscious buyers should consider sourcing a cheaper card one or two models back.

Furthermore, the two games that are potentially the biggest spur to upgrade — Doom 3 and Half Life 2 — have been delayed well into 2004. With no other application really punishing high-end systems, there's much to be said for waiting a couple of months to see what new offerings the video giants have planned for the coming year.

If you're upgrading a system from a GeForce 4 or pre-9500 Radeon series card, then the performance gains will be gratifying and noticeable.

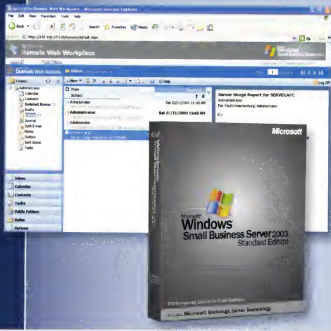
Taking into account longevity, it's hard to look past the ATI Radeon 9800XT. It performs to a high standard on older applications, and its execution of DirectX9 is more efficient than Nvidia's FX 5950 Ultra. When pushed at higher levels of anti-aliasing and resolution, the 9800XT stacks up a lot stronger than the Nvidia alternative.

To its credit, Nvidia has really put itself back in the race after a disastrous start to the year. There's almost nothing in this contest when judged at a resolution of 1,024 x 768 or under.

The raw speed of execution in OpenGL offered by the FX 5950 Ultra is heartening. As Nvidia has been working on a 0.13 micron process for a year, it looks to have worked through teething problems. But for now, build quality issues notwithstanding, ATI remains the pace-setter. **EDIT**

Details	
Gigabyte GeForce FX 5950 Ultra	
Contact	Synnex
Phone	(03) 8542 8888
Online	www.synnex.com.au
Price	\$859
	Excellent OpenGL performance; sturdy build quality.
	DirectX9 performance issues.
Verdict	●●●●○
PowerColor Radeon 9800XT	
Contact	Australia IT
Phone	(03) 9543 5855
Online	www.australiat.com.au
Price	\$870
	Fastest across-the-board speed; solid DirectX 9 performance.
	Average build quality.
Verdict	●●●●●

► **Big impact for small biz:** SBS 2003 is easier to manage and boasts improved features at a lower price.



Good thing - small package

Microsoft's new Small Business Server delivers a solid and integrated platform suitable for any small business or workgroup.

Once again, Microsoft's "third time lucky" axiom (think of Windows, NT, CE, Word and IE) is holding true. Originally built on Windows NT 4 Server, the debut of Small Business Server was little more than a rag-tag bundle of server applications sitting behind a customised, but buggy, UI and locked to a limit of 25 users.

SBS 2000 lifted this to 50 users and, more importantly, added a business-class firewall and superior management tools. While a decent product in its own right, there were still several rough edges and a high ongoing cost to maintain what was an unnecessarily complex system. Smoother to install, easier to manage and boasting better features at a lower price tag, Small Business Server 2003 finally gets it right. Not every time, but often enough. Minor flaws aside, it's suitable for any small business or workgroup ready for a server-based network.

The maximum number of clients available under SBS has now increased from 50 in SBS 2000 to 75 in SBS 2003, with the entry-level Standard package including five client licences and retailing for \$1,100. Purchasing additional licences (at \$180 per user or machine) now only requires the entry of key codes and an online activation, compared to the flock of floppy disks issued under SBS 2000.

WHAT'S YOUR FLAVOUR?

There are two versions of SBS 2003 (which uses Windows Server 2003 as its backbone). The Standard build has the Server 2003 platform, Exchange Server 2003, SharePoint Services and shared fax services.

The Premium package adds SQL Server 2000 and ISA Server 2000. With 2004 versions of both programs due mid-year, it's hard to fathom why Microsoft considers the demand for the new Premium edition is such that it couldn't wait another six months. Hopefully customers will be offered a free upgrade to ISA Server 2004 and SQL Server 2004 upon their release.

Installing SBS 2003 is straightforward, but takes several hours. Our test server was a 3GHz Pentium 4 with 512MB of RAM, driving a variety of client PCs running Windows XP and 9x with a shared printer and a 256KB/s ADSL connection.

Recommended hardware for running SBS 2003 is a 550MHz CPU with at least 384MB of RAM for Standard and 512MB for Premium (the maximum supported RAM is 4GB). Testing shows SBS to be quite RAM-hungry, so plenty of memory is needed to run it. Barely getting off the ground with 256MB, users should aim for at least 512MB for a server supporting up to five users, and add 64MB for every additional client. Processor speed is less important unless the server is running SQL Server or other line-of-business applications.

Earlier versions of SBS aren't renowned for being OEM install-friendly. Only the base OS was pre-installed on any server, so all the server-based applications had to be installed at the client's site. SBS 2003 has made great strides forward in this area, with a 15-minute installation and customisation routine until you get to the helpful "To Do List".

While the upgrade process from SBS 2000 proves fast and faultless, users of SBS 4.x are led a merry dance, requiring the migration of data to a new server or backing it up, installing a clean copy of SBS 2003 on the old server, and then restoring the data.

To ease recovery in the event of a total system meltdown, licences can be backed up to a file and reinstalled without calling Microsoft to request client reactivation.

Another sensible feature is that clients running Windows 2000 or XP Professional can be configured to participate in the SBS network using a Web-based wizard. This configures all the necessary network settings and joins the client PC to the SBS domain.

One limitation with SBS 2003 is that it has to be the only domain controller in the business. If company's have branch offices that require a server, they can deploy additional Windows 2000/2003 servers, but all authentication still has to be done by the main office SBS.

INTRANET TO GO

SBS 2003 provides users with a fully-configured intranet built around SharePoint Services out-of-the-box. With areas for projects, presentations, discussion forums and other shared information, it's a natural network hub. Incoming faxes are delivered to an intranet folder for further inspection and forwarding to the right recipient.

Customisation options range from simple colour schemes and layouts to modular auto-updating "Web parts" from MSNBC, including local news tickers, stock quotes and weather forecasts.

Employees can also remotely access their email and faxes, check the intranet and connect to their desktop PC (if it's running Windows XP Professional) using the Remote Web Workplace (RWW) feature.



The Web-based interface to the Exchange mail server of Outlook Web Access (a part of RWW) mimics the look and feel of Outlook. It's almost indistinguishable from the Outlook 2003 client, and runs much faster than it did in SBS 2000.

When the wizard to configure Remote Web Workplace with SSL is run, it offers options to use a self-signed certificate, or purchase a certificate from a trusted vendor for better security.

Administrators and support techs also have a handy entry point to reports and the remote desktop of the server, and to any XP Pro client PCs. It also displays a useful list of helpdesk requests generated by the network users and allows remote administration of the intranet.

As with all Internet-related functionality in SBS, it's recommended that a fixed IP connection to the Net is purchased, or if this isn't possible, that a dynamic DNS service is configured. By doing so, employees accessing the server from the Internet can then reach the Remote Web Workplace, Outlook Web Access and Outlook Mobile Access services.

EMAIL HERE, THERE AND EVERYWHERE

Exchange 2003 makes a superb email hub for the small business network, especially when it comes to accessing Outlook remotely. In SBS 2000 there are only two options for this: use the slow and limited Outlook Web Access, or connect to the company's internal network via a VPN connection, which is often a challenge to configure and maintain.

In SBS 2003, there's a third and very sensible alternative to encapsulate remote procedure calls in the HTTPS protocol, and to connect Outlook on a remote PC directly over the Internet to your server. This provides all the rich functionality of Outlook without the hassle of a VPN connection. During our test installation the wizard forced us to configure SSL, thus protecting both the login procedure and encrypted the traffic between Outlook and Exchange.

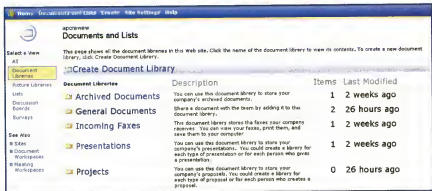
Also new is Outlook Mobile Access, which serves as an Internet conduit for users needing email access from Pocket PCs and Windows-powered smartphones.

The single most disappointing aspect of Exchange 2003 is that Microsoft has removed instant messaging, no doubt to encourage users to stump up for the company's new business IM product, Office Live Communications Server. Many users of SBS 2000 who've come to rely on IM will prefer to keep an SBS 2000-based IM server if they've got more than one server in the network, buying an additional one for the sake of office chat could be hard to justify.

SMALL BUSINESS BACKUP

Anyone who's attempted to configure a backup in SBS 2000 and ended up juggling several tapes knows it's not an easy task. SBS 2003's Backup Wizard steps you through creating a media rotation scheme, with a reminder email automatically sent to the team member responsible for changing the tapes. The wizard configures full backups for every weekday and assumes that one backup tape has enough space for a full backup — there's no function for spanning multiple tapes.

If you need more flexibility, or prefer another type of backup media, you'll have to skip the wizard and use the Windows Server 2003 backup program directly.



► **Share it:** SBS 2003 provides you with a fully-configured intranet built around SharePoint Services.

There's also support for complete server restore from a backup without having to install the OS first.

A feature that's bound to be both an administrator's and user's best friend is Volume Shadow Copy. This gives users the ability to restore an older version of a file, or a deleted file, within Windows Explorer by setting aside a portion of the server's data disk for saving changes to files as they get altered or deleted. As restores from a backup are most common when a file has been accidentally deleted or overwritten, rather than in a disaster recovery scenario, this feature is most welcome.

The monitoring and reporting functionality of SBS 2000 has always been a favourite of IT consultants, as the daily report gives a quick overview of the health and status of the server.

Especially pleasing is the inclusion of both performance reports and usage reports. The usage reports now include email and fax statistics whereas in SBS 2000 there were only preconfigured reports in ISA for Internet utilisation.

Performance reports are now more to the point, only giving the most important information: the top five processes consuming memory and CPU time and any serious errors in the event logs.

A canny trick employed by many SBS 2000 admins was to switch Terminal Services into "application mode" to shift the processing load from old client PCs onto the server (not recommended by Redmond).

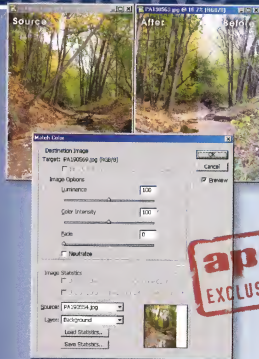
SBS 2003 puts its foot down by refusing to run TS in application mode, although a wizard configures a secondary Windows 2000 or 2003 server for Terminal Services.

SBS has finally matured from being a spin-off from the "real" servers to being custom-designed for small businesses. SBS 2003 will appeal to both small businesses ready to move to a server-based network and to existing customers looking for enhanced email, intranet and communication features.

Paul Schnackenburg

Details

Contact	Microsoft
Phone	13 12 58
Online	www.microsoft.com.au
Price	Standard, \$1,100; Premium, \$2,700 with five licences, additional licences, \$180
✓	Strong administration tools; flexible information access; powerful Internet and intranet functions.
✗	Manual configuration of Win 9x clients; IM no longer included.
Verdict	●●●●●



► **Point and click correction:** the Match Color command makes it a snap to correct a series of images shot under different lighting conditions.

Picture perfect

This feature-packed upgrade proves why Photoshop remains the industry standard in graphics.

Adobe might have tossed a googly by tagging the successor to Photoshop 7 as CS rather than version 8, but it's one of the most ambitious and exciting Photoshop updates ever.

The "CS" moniker indicates that Photoshop is part of the company's new Creative Suite line-up, which encompasses other upgraded products (including Illustrator, InDesign and GoLive) that are available individually or as part of the Creative Suite bundles.

Photoshop CS boasts a raft of new features, but you'll need to run Adobe's product activation wizard before you can enjoy any of them. The company's

take on PA includes a 30-day grace period and permits

Photoshop CS to be installed on two machines, as long as they aren't being used at the same time.

DIGITAL DYNAMICS

The inclusion of the 16-bit Camera RAW plug-in, which previously sold for almost \$200, makes upgrading to Photoshop CS a no-brainer for anyone working with professional digital photography. The plug-in opens RAW image files, enabling users to directly adjust white balance, temperature, tint, exposure, colour space and noise reduction.

The full 16-bits per channel editing capabilities are a powerful complement to the RAW plug-in. While Photoshop 7 users have to

perform graphical gymnastics to accomplish all but the simplest tasks in 16-bit mode, most of Photoshop's tools are at your disposal in CS, including layers, adjustments, channels, shapes, filters and styles.

The new Match Color, Shadow/Highlight and Photo Filter adjustment commands are extremely useful. Match Color applies the colour and tonal range from a specified source file to the active image (or selection) — very handy for correcting a series of images where the white balance or lighting conditions have changed.

Shadow/Highlight restores or reveals detail that may be hidden in shadows or "blown out" in the highlights of an image. While the same results may be achieved using Levels or Curves, this tool does the job in a fraction of the time. Photo Filter simulates the application of a photographic filter, used to warm or cool image colours or to correct the colours of pictures taken with the wrong white balance. You can even preview 16-bit adjustments in a dynamic histogram palette.

A scripting plug-in that combines the capabilities of JavaScript and/or Visual Basic (or AppleScript for the Mac) with Photoshop's feature set is also included.

The program has an impressive list of keyboard shortcuts, but previous versions limited users to a handful of customisable function keys. Thankfully this version allows users to assign or reassign keys to frequently-used commands such as Image Size, Canvas Size, Crop and Stroke. These shortcuts appear in the menus and the Summarize feature generates an HTML index of your keyboard assignments.

There are plenty of other seemingly small yet significant features in CS. Users can finally add text to a path or into shapes, and layer sets can be nested up to five deep — a real benefit for complex design projects and Web layouts. Nested sets are also maintained when importing documents into the CS versions of ImageReady and Illustrator.

BETTER BROWSING

Adobe has also improved the file browser introduced in version 7. Its sluggish response time, lack of features and poor configuration capabilities make it a weak substitute for other standalone alternatives. The new file browser is noticeably faster, fully integrates Camera RAW support, and includes automation features such as batch processing and renaming, meta tag read/write capabilities, an extensive search facility and a customisable interface.

While the revamped file browser may not entirely replace the need for a dedicated image management tool, it's a powerful "command centre" for viewing and processing images within Photoshop.

ImageReady CS — Photoshop's co-installed, Web-centric sibling — has also been tremendously improved. Its GUI has been redesigned and shares Photoshop's CPU-optimisation routines, making it much snappier than previous releases.

Other wins include auto guides, conditional actions, the ability to execute commands over multiple layers and improved support for Macromedia Flash (SWF), DHTML and XHTML.

Photoshop CS offers unprecedented power and flexibility, making it a must-have upgrade for almost anyone serious about design.

Trevor Morris

Details ►►	
Contact	Adobe
Phone	1300 550 305
Online	www.adobe.com.au
Price	\$1,399; upgrade \$349
✓	Camera RAW, 16-bit support; GUI improvements.
✗	Expensive.
Verdict	●●●●●

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Breaking up's not hard to do: dividing content across two disks is a breeze with DVD X Copy.

XPRESS

The main purpose of Xpress, the most basic of the trio, is to create an exact copy of the main feature on a DVD, with a single audio track and subtitle. By default, all other audio languages, menus, special features and deleted scenes don't appear in the copy. However it doesn't support archiving discs containing multiple episodes of a TV show.

Xpress also gives users the option to copy entire discs onto a single-layered DVD, although the picture quality and resolution are reduced. The drop in quality is barely noticeable on a PC monitor or a big screen TV.

The duplication process is effortless: load the disc, choose language, wide- or full-screen format, subtitle inclusion, then click to begin. All up, this process takes around 30 minutes to complete, but the feature's length and the speed of your DVD writer will greatly affect copy time.

However, Xpress can be inconsistent. It copies some discs without problem, but refuses to work with others, with no distinguishing feature between the discs it will and won't duplicate.

GOLD

The DVD X Copy Gold interface is cryptic at first glance, but its short, informative tutorials quickly guide you through the process.

This version adds backup support for more complex DVD features including multi-angle shots, extra footage and multiple episodes. In most cases, a movie goes onto one DVD while the extras are shunted onto a second. If a movie is too big to fit on one disc, the software splits it at the nearest chapter. For a series, it chooses the best way to fit a maximum number of episodes onto each disc. Or you can compress the DVD onto one disc. Also impressive is its multi-channel audio support, copying Dolby Digital 5.1 and DTS sound alongside the movie.

PLATINUM

DVD X Copy Platinum produces perfect backups of DVDs spanning several discs, or compresses data for a single-disc duplicate.

This version has simple and advanced modes: Simple mode launches the Xpress application; Advanced gives users more control over which parts of a DVD will be copied, with limited control over compression.

The Platinum package also includes a DVD X Rescue utility to bring scratched and damaged DVDs back to life — at least, for long enough to clone them. In our tests the software always read the disc on the first attempt, which is all you need to make a copy, although it sometimes fails on successive efforts — even if the damaged disc isn't removed from the drive. The quality of this tool is generally below the standards of the X Copy series and it shouldn't be relied on to work every time.

So, to which of these three is the best solution? The limitations of Xpress make it less appealing, even with the low \$139 asking price. The more thorough DVD X Copy Gold (\$259) is a better choice, and the \$299 Platinum suite is only worthwhile if you want to be ready to handle damaged discs.

Nick Race

Details	
Contact	321 Studios
Phone	(02) 9975 2799
Online	www.321studios.com.au
Price	Xpress, \$139; Gold, \$259; Platinum, \$299
Verdict	●●●○

3... 2... 1... copy

Backing up your precious data to DVD couldn't be easier with DVD X Copy.


If you're anything like the team at APC, the library of DVDs you've built up over the past few years represents a large financial and emotional investment. But when accidents happen, it's goodbye DVD, hello drink coaster. 321 Studios' DVD X Copy family of products is like an insurance policy for your DVD collection, enabling quick and simple backups to cheap DVD discs.

The three software packages that make up the range — Xpress, Gold and Platinum — are differentiated by the tasks they can perform and the method used for fitting a full-length movie onto a normal disc. Commercial DVDs use dual-layer 9GB discs, while home burners can only write to a single layer of 4.7GB, so special workarounds are necessary for adjusting movies for the smaller disc size.

At time of publication, 321 Studios was entangled in a legal tug-of-war with nine major movie studios. Mid-2002, the developer of DVD X Copy applied for a declaration that the sale of its software didn't violate the United States' Digital Millennium Copyright Act (DMCA). The movie studios fired back with a cross-claim seeking a permanent injunction to prevent 321 Studios from selling DVD X Copy. This has yet to be ruled on.

Worth noting is that Australia has almost identical prohibitions against circumventing technological protection measures in the Commonwealth Copyright Act 1968.

SONY



Using the Sony DVD burner is so easy
you'll think you're a genius.

Sony's smart new multi-format DVD Burners come with their own easy-to-use multi-media software. So in a couple of clicks, you can record and play CDs and DVDs, store pictures, make your own movies and custom audio compilations. Which means the only thing easier than using one, is choosing one. Visit www.sony.com.au or call 1300 13 SONY (7669) for more information.



Details

Contact Dell
Phone 1300 303 107
Online www.dell.com.au
Price \$599

Fast, USB and parallel ports; collect-and-replace warranty.

Doesn't accept identical Lexmark cartridges.

Verdict



Clone wars

Dell makes its move on the personal laser printer market — with a rebadged Lexmark.

After over a year of industry speculation and several months of rumour, Dell has finally added printers to its line-up of desktops, notebooks and other PC peripherals. The direct vendor is starting off with small but carefully measured steps and has signed on Lexmark as its OEM.

Apart from Dell's trademark silver badge, the P1500 is identical in almost every respect to Lexmark's E321 (which retails for \$40 less). But it has definitely backed a winner, as the E321 is one of the best personal lasers available. Its print engine is rated at 19 pages per minute at 300dpi; under testing it spat out 12 pages of mixed text and graphics at 300 and 600dpi in just under one minute.

The 16MB of memory is more than enough for almost any home or office application, and toner monitoring software flashes a "time to re-order" warning on your desktop when the cartridge runs down to the 25%, 10% and 5% levels.

APC
EDITOR'S
CHOICE
JAN 2000

While sold as a personal laser, the P1500 is also be quite capable as a shared workgroup printer hanging off a host PC (it supports both USB and parallel interfaces), as long as you don't mind refilling the paper tray every 150 pages.

While the P1500's toner cartridge is identical to that of the E321, this printer refuses to recognise the Lexmark cartridge — due, no doubt, to cunning engineering to ensure customers can only use Dell-branded cartridges. These start at \$148 for a low-yield recyclable cartridge (rated at 3,000 pages at 5% ink coverage), and step up to \$169 for a high-yield (6,000 pages at 5%) recyclable module. Empty cartridges are collected by Dell upon delivery of the next replacements, but users opting for the disposable high-yield cartridges have to pay \$40 more — ample encouragement for going with the more environmentally-friendly product.

Warranty arrangements for the P1500 are consistent with Dell's focus on after-sales service, with an onsite "collect and replace" scheme offered for the first year.

David Lin

Dell P1500

Avocent SwitchView SV400UA-AU

Details

Contact Avocent Australia
Phone 1071 3253 1111
Online www.avocent.com.au

Price
USB 4-port (audio), \$297;
USB/PS2 2-port, \$264;
USB/PS2 4-port, \$313.50

Affordable.

Expensive cables: doesn't support all keyboards/mice.

Verdict

Save on desk space by sharing your full suite of peripherals with up to four PCs.

Avocent's SwitchView USB 4-port (audio) model enables up to four PCs to share a USB keyboard and mouse, VGA monitor, two USB peripherals, speakers and a microphone.

The unit switches video well, with no distortion evident, even at resolutions up to 1,280 x 1,024 pixels. However, it's let down by compromises in its support of USB keyboards and mice. For a start, the SwitchView doesn't maintain idle USB connections when switching from computer to computer, resulting in USB reconnection delays of up to 10 seconds for each switch.

Additionally, only specific brands and models of keyboard and mouse are supported, so check the compatibility list on Avocent's Web site if you're considering buying this switcher. Unsupported hardware may work, like the Logitech Wireless MX Duo, but some extended hardware functions such as battery level won't properly pass through.

A firmware upgrade adding support for the latest hardware should be available on Avocent's Web site by the time you read this. However, it's uncertain as to how long the company will continue to update the firmware once this model is superseded.

There's also a separate two-port USB hub built in for peripherals such as a printer or scanner. This also drops USB connections as part of its normal operation, so expect Windows to re-detect this hardware every time you switch. A somewhat lengthy keyboard shortcut can work around this, switching only the keyboard, mouse and monitor, while leaving peripherals connected via the USB hub.

Another oddity is Avocent's unusual approach to getting each PC's USB connection into the switcher — one end of the cable plugs into the PC's normal USB port, but the other pipes the USB signal through the HD15 VGA monitor plug on the unit's back. As a result, users would also have to buy the manufacturer's rather expensive (\$44) proprietary cables for each PC.

The manufacturer also offer USB/PS2 switches in 2- and 4-port configurations, but PS2 support comes at a premium.

Dan Warne





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64-bit speedster

The Power 8355's feature set makes it ideal as a heavy-hitting mobile workstation.

This second Athlon 64 notebook we've seen since AMD launched its 64-bit superslab. As with the QDI Alacritas (reviewed in APC November 2003, page 39), Pioneer's Power 8355 is a sturdy but unassuming-looking notebook which packs a weighty punch — 3.8kg on its own, or 4.5kg with the power brick and cable.

The Athlon 64 3200+ chip is AMD's equivalent to a Intel's 3.2GHz CPU. This is partnered with 1GB of DDR memory, VIA's K8T800 chipset and a 15in LCD display powered by the ATI Mobility Radeon 9600 GPU. On the drive side you get a 60GB, 7,200rpm desktop-class hard disk and a DVD-burner.

Initial concerns about power consumption and overheating proved unfounded — the Power 8355 running on a lap is no warmer than any other current notebook. BatteryMark testing records over three hours' battery life — remarkable considering this is the first time we've seen a notebook using Hitachi's 7,200rpm, 2.5in hard disk.

The only oddity is the power supply. It constantly emits a low-frequency hum when plugged into the mains, whether it's charging the notebook or not. This isn't noticeable in a normal office, but it is in quieter environments.

Frustratingly, we didn't get the opportunity to test the Power 8355's full potential by using a 64-bit operating system. Nevertheless, testing under 32-bit Windows XP shows the Power 8355 to be a flyer. Expect these performance scores to increase as soon as Microsoft releases its Athlon 64-compatible version of Windows XP. A score of 33.6 under Business Winstone is better than most desktop PCs. It also rates well as a games machine, managing a very playable 206fps in Quake at 1,024 x 768 resolution, and 9,559 3DMarks using the 3DMark2001 benchmark.

All this computing goodness comes with a \$4,000 price tag, which is cheaper than the \$4,695 asking price for the Alacritas. It's still a hefty investment and probably best left for engineers and draftspeople with a need for this sort of computing and graphical power.

David Lin

ASUS L5800GM

Portability to the Extreme

ASUS' latest desknote features Intel's answer to AMD's Athlon 64: the Pentium 4 Extreme Edition.

PC purchasing trends are gradually moving away from the traditional desktop boxes to desknote systems. Hefter than regular notebooks, the emphasis is on portability rather than mobility.

The ASUS L5800GM features Intel's Pentium 4 Extreme Edition processor, running at a blistering 3.2GHz. Separating this chip from the rest of the P4 pack is 2MB of L3 cache, designed to give an extra boost to games and multimedia applications. But all of these extra transistors increase power consumption, and also generate a fair bit of heat. This means that the 4400mAh battery only provides around 70 minutes of power, which is bad news for road warriors.

Under benchmarking, the ASUS proves to be a gamer's dream. The GeForce FX Go6600 GPU helps it achieve a whopping 10,048 under 3DMark2001 — over 30% higher than the mark set by QDI's Athlon 64-powered Alacritas (APC November 2003, page 39). And its blistering Quake III Arena frame rate of 23Bfps reaches the domain of a desktop player.

Its multimedia results are equally impressive, scoring 48.4 in Winstone Multimedia Content Creation 2000, but regular Office applications bring the P4EE processor back to the level of the rest of the desknote field. Its 512MB of DDR SDRAM and 80GB hard disk are also on par with the competition.

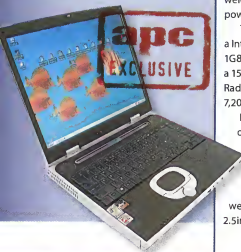
A Toshiba SD-R6112 slimline DVD-R/RW and ASUS 802.11g Wi-Fi adaptor are both standout features, with four USB 2.0 ports surrounding the desknote — one on each side and two on the rear. The usual array of serial, parallel, D-sub, S-Video, Fast Ethernet, modem and 4-pin FireWire ports are included, as well as a floppy drive. Topping it all off is a 15in panel capable of displaying resolutions up to 1,440 x 1,050.

But surely this new and exclusive gear comes at a cost? Cassa couldn't provide us with accurate pricing before we went to print, but the company expects the L5800GM to sell for around the \$4,500 mark. While it's a couple of hundred dollars more expensive than the majority of the competition, no other manufacturer comes close to offering the same amount of performance and features on a desknote.

Jarrod Spiga

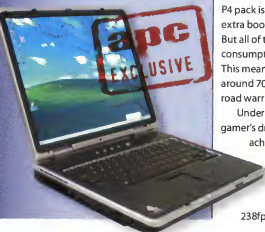
Details

Contact	Pioneer Computers
Phone	(02) 9670 2888
Online	www.pioneercomputers.com.au
Price	\$3,999
✓	Very fast; battery life
✗	Noisy power supply
Verdict	●●●●○



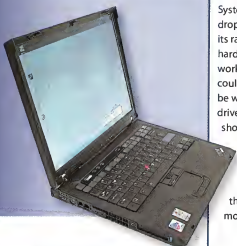
Details

Contact	Cassa
Phone	(07) 3853 5444
Online	www.cassa.com.au
Price	Around \$4,500
✓	Gaming performance, powerful
✗	Heavy; short battery life
Verdict	●●●●○



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Details	▶▶
Contact	IBM
Phone	1800 289 426
Online	www.ibm.com.au/ thinkpad
Price	From \$2,199 (as tested, \$3,399)
✓	Extra hard disk protection.
✗	Heavy.
Verdict	●●●●○



IBM ThinkPad R50

Rock steady

Stacks of grunt and active protection make this ThinkPad ideal for rough and tumble in the field.

With a Pentium M chip at the heart of most of today's notebooks, it's a challenge for manufacturers to make their machines stand out from the pack. That's especially true in the cluttered mid-range \$3,000 market, but this IBM distinguishes itself with ease.

The R50 employs the same Active Protection System as the ThinkPad T41 — if the notebook is dropped, a microchip on the system board detects its rapid acceleration and temporarily parks the hard drive's heads to prevent disk damage. If you're working in an environment where the machine could take some knocks, the sensitivity can even be wound back to prevent false alarms. Further drive-protection is offered in the form of shock-absorbing mount pads.

The R50 also shares other ThinkPad T traits, including: an embedded security chip supporting user lock-out and data encryption; one-button restore to a system image saved on the drive; and network management software for moving between wired and wireless networks.

The mid-range build includes a 1.5GHz Pentium M processor, 256MB of RAM, a 40GB hard drive, a 15in XGA 1,024 x 768 screen driven by a 32MB ATI Mobility Radeon 7500 adaptor, a combo CD-RW/DVD drive and Gigabit Ethernet. It performs at a decent clip, and easily completes our productivity applications. A Business Winstone score of 25.3 and 4,006 in 3DMark2001 Pro should make everyone happy.

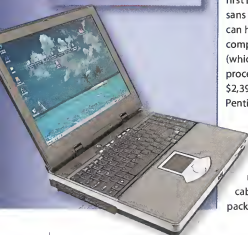
It also proved no slouch when it comes to battery life, scoring four hours and 37 minutes under the BatteryMark test. Although it's a little on the heavy side at 2.92kg, the R50 is so well-balanced that it feels significantly lighter in the hand.

The R50 series kicks off at \$2,199, with a 1.4GHz Pentium M processor, 256MB of RAM, a 30GB hard disk, DVD drive, 14.1in screen, 32MB ATI Mobility Radeon 7500 GPU and a one-year warranty at base configuration. The \$5,499 model boasts Intel's fastest 1.7GHz Pentium M chip, 512MB of memory, 60GB hard disk, DVD-R drive, 15in XGA+ panel and a 128MB ATI Mobility FireGL T2 graphics engine, plus an integrated tri-band (802.11a+b+g) wireless card and three-year warranty.

David Lin

AQOpen Openbook B165

Details	▶▶
Contact	Bluechip Infotech
Phone	021 8745 8400
Online	www.bluechipit.com.au
Price	Barebones, \$1,299, as reviewed, \$2,399
✓	Highly configurable.
✗	Barely portable; no battery; runs very hot.
Verdict	●●●●○



Desknote heavyweight

Barebones or otherwise, the Openbook B165 sacrifices mobility for pure power.

Desknote-class notebooks are surging in popularity thanks to lower prices and impressive specs. Now viewed as a viable alternative to a desktop PC, they typically use a desktop processor instead of a more expensive and slower mobile chip.

AQOpen has released an interesting take on the theme with its Openbook B165; the world's first barebones notebook. The B165 is available sans CPU, hard disk and RAM for \$1,399, or you can have it configured with commonly available components. It relies on a a Springdale-G chipset (which is suited to a desktop Pentium 4 or Celeron processor), a 3.5in hard disk and DDR SDRAM. Our \$2,399 review model shipped with a desktop 3GHz Pentium 4 CPU, a 60GB 3.5in hard disk and 512MB of DDR memory.

Other features such as the 15in LCD screen and DVD-ROM/CD-RW combo drive are standard notebook fare. With no internal battery, the power brick and cable are permanent fixtures, pushing the package's weight to a whopping 6.07kg. The B165

is certainly a desktop replacement rather than a portable PC.

The end result is one of the fastest notebooks we've ever seen. It runs a blistering 30.6 in Business Winstone and 2,110 3Dmarks in 3DMark2001 Pro. Gamers should be pleased by the Quake score of 60.5fps at 1,024 x 768 resolution. While this model has an integrated Intel 865G graphics chipset, an optional \$199 Nvidia GeForce 4 Go 440 daughter card can slot into the notebook for a considerable boost in frames.

The beauty of AQOpen's approach lies in the system's modularity. Five screws on the underside allow easy access to internals like the CPU, hard drive and memory. As these are desktop components, they're usually readily available and cheaper than their mobile-specific counterparts.

Apart from its weight, the B165 produces an awful lot of heat. Its fan is relatively quiet, and the rear carry handle can be folded down to lift the backside for adequate airflow.

Taking up less space than a desktop PC, the Openbook is an ideal solution where office space is at a premium.

David Lin

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► **Jack of all trades:** the PSC 2510's multitude of ports and connectivity options makes it a winner.

connected by Ethernet during the setup stage before it can run wirelessly.

One fiddly requirement is the need to uninstall and reinstall the software if you need to change the type of connection. For example, if you install it initially as a standalone printer via USB, but then want to use it wirelessly, the software has to be uninstalled and then reinstalled.

Post-installation configuration can be performed from the console or remotely via an embedded Web server onboard the MFD. Simply point the browser to the Photosmart's IP address and a configuration page is displayed.

SLOW BUT STEADY

Speed isn't the PSC 2510's forte: a final scan took 20 seconds, a mono copy took 35 seconds, and a colour copy took one minute and 12 seconds. Printing didn't fare much better. A 300dpi, 12-slide PowerPoint presentation took two minutes and 30 seconds to print, and produced pronounced banding on plain paper. At 600dpi the time blew out to nearly seven minutes, but most of the banding disappeared. A 12-page text document took around one minute and 20 seconds at 300dpi, and two minutes and 27 seconds at 600dpi. The scanner's image quality was average, giving a subdued interpretation of the fluoro orange colours on our scan target.

Photo print quality, on the other hand, proved top-class. Photo printing using the best settings with photo paper took five minutes and 30 seconds for an A4 print. Conventional black and tri-chamber CMY cartridges are supplied, and the results using this arrangement were quite satisfactory. The black can be swapped with a special photo cartridge; however, we found little difference in the results.

The PSC 2510 also includes the ability to print proof sheets. The device simply arranges thumbnails of the contents of a camera's memory card onto one or more sheets of paper. Printing can be performed directly from the card without any computer intervention. Even video files can be transferred to hard copy: the PSC 2510 detects video footage on a memory card and prints a sample of nine frames on a proof sheet.

The HP software bundle includes the latest version of HP Director, a front-end for all HP imaging devices, as well as the Photo and Imaging Gallery, Instant Share utilities, IRIS OCR and other assorted applications.

All up, this is an amazing piece of integrated technology. A lot of thought has gone into the overall user interface, resulting in a polished and accessible device.

David Lin

Slot machine

A scanner, printer, copier, card reader and a multitude of connectivity options makes HP's latest combo device suitable for any home office.

All-in-one solutions are rapidly increasing in popularity, and it's no wonder. With prices falling and component quality at an all-time high, there's no better time to get a multifunction device (MFD).



The PSC 510 is a converged colour inkjet printer, flatbed scanner and fax, with a raft of connectivity options.

The USB plug-in via host PC or Mac is par for the course, but the slots for CompactFlash, Memory Stick, SD/MMC, SmartMedia and xD flash memory cards make it more versatile than the average printer — and incredibly convenient for digital camera owners.

The HP PSC 2510 is the only MFD to offer both wired and wireless network support, which may seem suitable for a workgroup environment, but this machine can't produce the speeds required for a busy office. However, the fact that Ethernet and 802.11b wireless LAN connectivity are supplied out-of-the-box is very impressive.

MAKING CONNECTIONS

Installation is surprisingly easy. The direct, Ethernet and peer-to-peer (ad hoc) wireless network installations are straightforward and require little intervention. Some configuration of the connection is required when a wireless access point is involved — the PSC 2510 needs to be

Details ►►	
Contact	Hewlett-Packard
Phone	13 23 47
Online	www.hp.com.au
Price	\$499
✓	Multiple input options: Ethernet and 802.11b connectivity.
✗	Slower than dedicated devices.
Verdict	●●●●●

priced to mesmerise.

The ASUS A2H is a notebook that will mesmerise you. Firstly it is packed with a full list of practical features at a great price. But that's not all. Whether you are in a business conference or relaxing at a café, the A2H is your reliable and robust companion.

For connectivity, imagine the support of 5 USB 2.0 ports enabling you to hook up multiple peripherals easier and faster.



ASUS A2H

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Big screen bruiser

Toshiba's latest handheld pulls no punches as it squares up against the heavyweights from HP, PalmOne and Sony.

Topping the stunning PalmOne Tungsten T3 (reviewed in APC November 2003, page 42), Toshiba's new e800 Pocket PC goes where no PDA has gone before, with a knockout 4in display running in 480 x 640 VGA.

And a high-res screen isn't its only trick. Firmly establishing itself as a power user's PDA, the e800 boasts a choice between integrated Wi-Fi and Bluetooth — we tested the B02.11b unit — plus slots for both CompactFlash and SD cards, with the latter also supporting SDIO expansion devices. In the engine room is a 400MHz Intel XScale PXA263 processor and an ATI graphics controller with 2MB of dedicated memory, as well as 158MB of user-accessible memory (126MB of conventional RAM plus 31.2MB of Flash ROM).

An SPB Benchmark of 1,352 makes the e800 the second-fastest Pocket PC available, surpassed only by the ASUS MyPal A620's 1,573 due to the latter's stellar graphics performance. At 193g, this is also one of the heavier units around, and thus an unlikely shirt pocket candidate.

The 1,320mAh lithium ion replaceable battery runs for just over three hours playing looped MP3s at full volume with the screen brightness at its highest setting. Swapping to an optional high capacity 2,640mAh battery doubles this.

SIZE MATTERS

With most Pocket PCs sporting a 3.5in display, the e800's additional

half inch makes a world of difference, even at normal 240 x 320 resolution. Text is larger and sharper, colour fidelity is outstanding, and onscreen controls are easier to manoeuvre — even the software keyboard benefits with more stylus-friendly keys.

The e800's biggest drawback is that only the built-in ClearVue viewers for Word, Excel and PowerPoint documents, and JPEG, BMP and PNG images can be used in VGA mode. Its activation requires running the Screen Resolution applet and a soft-reset. Access to the start menu, any other programs and even the hardware buttons is disabled until you switch back to the lower-res QVGA (Quarter VGA) setting.

Because the OS doesn't support it across all applications, only being able to use the superb VGA setting as a viewer is a serious shortcoming that limits an otherwise groundbreaking feature. With integrated Wi-Fi, you'd at least expect a VGA-compatible Web browser.

However, a freeware third-party utility called ResFix overcomes this limitation, so that most standard Pocket PC applications can take advantage of the greater screen real estate. This is a must-have for all principally-visual applications. But not all of the built-in apps run full-screen in VGA — for example, Windows Media Player only runs at quarter screen. And no current video applications can run in full VGA at any decent speed — at best, Pocket TV is able to crawl along at 7fps.

Two of the e800's more interesting bundled apps are its hands-free Toshiba Voice Command and Toshiba Text to Speech. Voice Command lets you launch programs, select menu options and apply other settings with your voice. The unit seems to recognise most commands that are made relatively close to the unit. Text to Speech reads text files and email in an adequate, but rather robotic, male voice.

IP Phone allows VoIP conversations over Wi-Fi using a peer-to-peer connection or through the Gphone Buddy Service (a voice chat service offering a 60-day free trial). Wi-Fi configuration and connection are as painless as possible, and the Wi-Fi utilities are quite comprehensive, including a Wireless LAN Manager and ConfigFree tools, such as the Connectivity Doctor and Search for Wireless.

A BIT OF A HEAD-TURNER

The e800's distinctive midnight blue plastic shell and silver side grips avoid Toshiba's earlier "beige box syndrome". But its metallic trimming actually makes this device difficult to grip. The hardware button arrangement is also poorly designed — proximity to the B-way navigational pad makes it easy to press the wrong button.

With four times the screen room compared to other Pocket PCs, running apps at the higher res is a pleasure. But, while it's admirable that Toshiba is first to market with a VGA handheld, doing so before the OS could support it natively is premature. The lack of on-the-fly switching between QVGA and VGA without a soft reset, or even support for switching to landscape mode and vice versa, means that users may be better served by waiting until the mid-2004 release of Windows Mobile 2004, which is expected to offer these features.

Jenneth Orantia

Details	▶▶
Contact	Toshiba
Phone	13 30 70
Online	www.toshiba.com.au
Price	\$1,248.50
✓	VGA resolution; dual expansion; built-in Wi-Fi.
✗	Crippled VGA implementation; poor hardware button arrangement.
Verdict	●●●○



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Cyclone Computer
Hunt Computers
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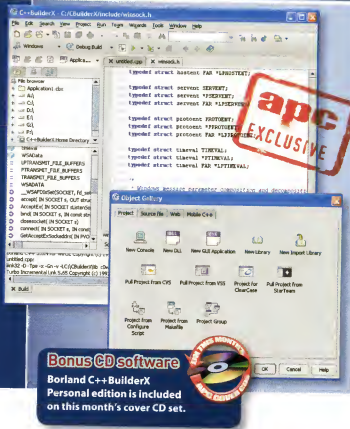
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► **Show us yer interface:** the IDE in all its glory, and the diverse range of project types C++BuilderX can create.

programmers or small teams; Mobile edition (\$567); and Enterprise, which has the works (and a hefty \$3,548 price tag).

The new Mobile edition includes specialised SDKs for writing apps targeting some, but not all, mobile phones — it only generates code for Symbian and Nokia devices.

Enterprise users get compilers by GNU, Microsoft, Intel, Sun and Metrowerx, Intel's VTune performance analyser, Borland's CORBA-based VisiBroker middleware, plus Altova XMLSpy, IBM's DB2 database server and Microsoft SQL Server 2000. Engineering and financial institutions will benefit from the high-precision Intel mathematics libraries, and when it's time to wrap up your finished applications, there's even a customised version of InstallShield.

PRE-LAUNCH SEQUENCE

Before you can start coding in C++BuilderX, you need to enter the serial number and authorisation key supplied. But the process doesn't end there — C++BuilderX only runs for 30 days unless a strict registration process is completed (which includes creating an online account with Borland). Unlike most product activation schemes, this isn't an anonymous, single-click process.

Former C++Builder and Delphi developers will find the IDE's layout unfamiliar. The trademark component palette and overlapping form and code windows have been replaced by a functional interface that's similar to Borland's JBuilder.

An understated but wonderful addition is the inclusion of version control to the editing process. A History tab is directly attached to each source code window and displays all modifications — by author — to the program code. The differences can be analysed; code can instantly be restored to a previous revision; and changes made on separate systems can all be merged back to the one file. This includes changes made in current editing sessions that aren't committed to disk.

C++BuilderX demands its users to be highly aware of their systems: for example, if the software is instructed to make a .NET application, it assumes the .NET framework is installed. If it isn't, there's no warning until the compilation fails. It's also possible to deselect optional components during installation which are necessary for certain project types, although no warnings are given and the project types still appear under the New menu.

Help files describe operation of the IDE and tools as well as all elements of the C++ language. The online "Quality Central" facility helps with submitting problems or finding bug-fixes. This requires another account, and is completely separate from the one created during registration.

As always, Borland's finely-honed editor can be highly customised, with extensive debugging facilities and blindingly fast compilation. Beginners need to exercise caution, but for C++ experts and teams this is surely the ultimate cross-platform IDE on the market today. Take it for a spin with this month's CD set, and check out our C++BuilderX Workshop on page 126.

David Williams

Details ▶▶	
Contact	Borland
Phone	1300 799 688
Online	www.borland.com.au
Price	\$1,419; upgrade \$851
	Multiplatform; C++/database tools; built-in version control.
	Cumbersome registration process; not beginner-friendly.
Verdict	●●●●○

Generation X

Borland takes its C++Builder rapid application development tool to a whole new level.

For years, the evolution of Borland's C++Builder was modelled on its older sibling, the Pascal-based Delphi rather than on competing C++ tools. C++Builder looked and acted like Delphi, almost as if its being C++ was just an accident.

This new incarnation sets things right and puts C++Builder onto a new path. And make no mistake, this is a new incarnation in every sense of the word. The successor to C++Builder 6.0 isn't a simple 7.0 release with an "X" tag applied by try-hard marketing folk. The program's About screen identifies it as C++BuilderX version 1 — the first step in a whole new direction.

The program comprises a rich set of tools of extraordinary breadth and depth, well-suited both for professional developers and corporate users requiring scalable and robust in-house applications.

These tools integrate tightly within the C++BuilderX IDE so that more time can be spent on genuine development instead of trying to make disparate pieces work together. This program is genuinely multiplatform, capable of running on and producing compiled code for Windows, Linux and Solaris.

Borland offers four variants: the free Personal edition, a stripped-down set containing the IDE plus Borland and GNU compilers (that can't be used for writing commercial applications but serves as an excellent foundation for anyone studying programming); the Developer edition (\$1,419), ideal for standalone



survival of the fittest

The ASUS M2N allows you to switch between internal CD drive, DVD drive, Combo drive, Floppy drive or a 2nd Hard drive. Plus with the built in Firewire support and USB 2.0 you can enhance connectivity turning your notebook into a multimedia hub.

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New Nuke is a blast

Whether running an online community or a blog, PHP-Nuke serves up your content without fuss.

PHP-Nuke is arguably the Internet's most popular news-based content management system (CMS). Version 7.0 adds new functionality, such as integrated discussion forums and improved upgrading from previous releases.

The phpBB forum software that used to

accompany PHP-Nuke 6.x is now seamlessly integrated into the core application, providing easier setup and allowing visitors to use a single login for the developer's news site and forums. Its developers have also plugged many of the security holes which previously left sites vulnerable to attack.

The overall look and feel of PHP-Nuke is identical to previous versions, although downloadable themes, modules, blocks and hacks can change the appearance of the site somewhat. If you want

to prevent your site from being labelled as YANS (Yet Another Nuke Site), other CMS engines like PostNuke prove much better for customisation.

When following the instructions to the letter, it's easy to set up PHP-Nuke on a Linux box running Apache Web Server with PHP and MySQL database server. However, even the slightest deviation can make for major hassles. For example, moving files from their default location to a protected folder can break several PHP-Nuke components, although there are ways to get around it.

One of the criticisms of PHP-Nuke is that it tries to be all things to all people. Supplementing the basic content management functions are forums, a statistics package, user journal and more. While this makes it easy to whip up an instant CMS-based site with plenty of features, most users won't require all of them. Fortunately it's easy to disable modules you don't need and replace them with more capable tools. This will be necessary in the case of the rudimentary Site Statistics plug-in, which can't compete with the likes of the more widely-used Webalizer.

Jarrold Spiga

Microsoft Virtual PC 2004

Virtual operations

Microsoft turns its back on Linux in the latest version of Virtual PC.

While it's surprising that Microsoft would encourage using an OS other than Windows, Virtual PC 2004 allows its users to do just that. But there's a catch. In this program's first update since it was purchased from Connectix, the handy Linux config wizard has been dropped.

Aimed at the same enterprise market in which the Penguin is currently landing so many punches, it's no surprise that the OS juggernaut has removed this feature.

Not that it can't run Linux on a Windows system. Virtual PC 2004 is still quite capable of running any modern non-Microsoft OS without flinching. Red Hat Fedora and Mandrake 9.2 run on our test XP machine through VPC2004 without a hitch. However, users intending to use this app to run Linux shouldn't expect to get any tech support.

You'll be hard pressed to find any difference between Microsoft's Virtual PC

2004 and Connectix' Virtual PC 6. To us it looks like there are only three new features: it now handles up to four network adaptors per virtual machine; supports a maximum 4GB of RAM; and uses an XML-based configuration to help duplicate VPC setups between machines.

Our tests indicate that Virtual PC 2004 allows VM-hosted operating systems to run at approximately 85% of the speed of the native OS, which is certainly bearable for most testing and training purposes. VPC 2004's support for a virtual hard disk enables users to maintain a guest OSes file system inside a single file on your Windows partition, which makes VM backups as easy as copying the file to a network drive or burning it onto a CD or DVD.

Fortunately, the Tux-friendly installer wasn't the only thing Microsoft dropped. Virtual PC 2004 retails for \$233, down from the \$450 asking price of its predecessor. This gives the \$430 VMware alternative a serious run for its money. Considering that there's hardly anything new in Virtual PC 2004, Microsoft is sensibly offering a free upgrade to users of Connectix Virtual PC.

Matt Overington

Details
Contact
Online
Price
Functionality without effort.
Some weak modules: non-distinctiveness.
Verdict

Details
Contact
Phone
Online
Price
Stable; fast virtualisation.
Specific Linux support dropped.
Verdict



perfection runs **with the best.**

The ASUS L5C notebook represents the flagship of the ASUS range and there are perfect reasons why it is the best. Put simply, if you want it you got it.

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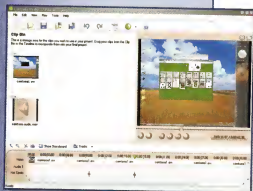
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Details

Contact	Code and Data
Phone	1300 307 207
Online	www.code.com.au
Price	Download, \$473; boxed, \$506
	Easy to use; powerful editing.
	Expensive.
Verdict	●●●●○



TechSmith Camtasia Studio 2.0

One-click clips

TechSmith's flagship video-capture utility is all you need for polished training and demo videos.

Camtasia Studio is an easy-to-use tool for producing training or demonstration video clips. Users can record onscreen activity across a full screen, a specific area, or just the active window, and save it for later editing. Driven from a taskbar, it provides quick links for capturing or importing video, recording narration, adding effects and publishing the content as a video.

One of the best inclusions in the Studio suite is its timeline and storyboard-based non-linear editing component. It enables you to crop clips, arrange them along a timeline and add an audio track to the storyboard. Users can record audio through a microphone while playing back the original footage, which means you don't need to worry about laying down commentary during recording.

A handy new feature in version 2 is a "Zoom-n-Pan" function that allows users



Camtasia Studio 2.0 — free 30-day trial.

to zoom in on specific sections of footage for added emphasis. It's possible to record the entire screen until an application is launched, and then zoom into the newly opened window so that it takes up the entire frame. Content creators can also add Flash "hotspots" to trigger actions such as launching a Web site or prompting for mouse clicks during playback.

After editing, you can dump the finished clip to a number of video file formats: AVI, QuickTime (MOV), Windows Media (WMV), GIF, Camtasia for Real Player (CAMV) or RealMedia (RM). If you want to maintain your hotspots and links, you'll need to output the video as a Macromedia SWF/FLV clip.

The crowning feature of Camtasia Studio 2.0 is its ability to produce executable or Web-based menus for easy media playback, even creating menus that automatically execute when a CD is inserted.

Three Camtasia Studio Components for Macromedia Flash MX are also available as free downloads. These complement SWF files made with Camtasia Studio and provide movie playback, linking and timing controls for Flash MX.

Matt Overington

Details

Contact	Lako Pacific
Phone	1800 657 601
Online	www.lakopacific.com
Price	Deluxe, \$99; PowerPack, \$149
	Speed; ease of use; packed with features.
	No Deluxe retail upgrade.
Verdict	●●●●○

ape
EDITOR'S
CHOICE
JAN
2004



Image-ination

ACDSee will ruthlessly hunt down, catalogue and manage all of your digital images.

Available as either a standalone Deluxe edition or bundled in the PowerPack suite, ACDSee takes the headache out of image management through its comprehensive range of easy-to-use tools.

The PowerPack bundles the ACDSee image viewer with FotoCanvas and FotoSlate. FotoCanvas offers the essentials for photo-editing without the superfluous features found in larger graphics programs. Red-eye reduction, lighting and exposure filter effects are included, and Photoshop plug-ins can also be imported. Meanwhile, FotoSlate deploys a number of wizards to make printing photos easier. A paper-saver minimises page usage when printing, while a similar wizard helps you create a range of documents, including CD/DVD sheets, calendars and greeting cards.

Both FotoCanvas and ACDSee support the EXIF Print format, which



ACDSee 6.0 demo — free 30-day trial.

adds information to a JPEG image to maintain colour composition, regardless of how it's used. Many digital cameras and scanners now support EXIF Print.

Where previously a separate application was needed, the ability to generate standalone slideshows and screensavers is now integrated into ACDSee using a wizard tool. HTML albums can be created in a similar fashion. Sharing images is a snap with the free SendPlix service, which allows you to upload photo albums and even send invitations to friends to view the images online. An Image Basket feature allows for manipulation of a batch of images simultaneously, regardless of their location.

ACDSee's Acquire wizard automatically finds all pictures on a hard disk, or in attached digital cameras, CDs or memory cards. Stored in a database, albums can be generated manually, or by searching for keywords, categories, capture date and time, metadata or even image ratings. This is useful when trimming albums down to a given size.

ACDSee is well-polished, stable and fast. Unless you're doing high-end image creation and photo manipulation, the functionality offered by the apps within the PowerPack are all you'll ever need.

Jarrod Spiga

Home Networking Starts Here!



WiFi-b™ WLAN Card

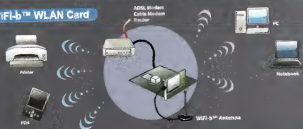
- 11 Mbps 802.11b Wireless LAN
- Wireless Internet Access Sharing
- Hassle-Free Home Network
- Free Software AP (under WinXP only)
- Easy Setup Wizard

Home Networking Starts Here!

ASUS Wi-Fi@HOME™, as the name suggests, is the latest platform specifically designed to simplify the process of building a wireless home network. In short, the goal of ASUS Wi-Fi@HOME™ is to enable reliable wireless data transfer through the 802.11b standard, easy internet access sharing, and simple setup at an affordable price.

This new platform includes three elements: ASUS motherboards with the Wi-Fi slot, the WiFi-b™ add-on card and ASUS Software AP (under WinXP only).

WiFi-b™ WLAN Card



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- VIA KT600/8237 Chipset
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- AGP 8X
- Gigabit LAN (AI NET)
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- 6-channel audio with S/PDIF digital out
- 8 x USB 2.0

Model List with Wi-Fi slot



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Visit www.asus.com for an updated list.

Product specifications may not be exactly as shown. Please verify the specifications with your dealer prior to purchase. The specifications are subject to change without notice.

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Just press play

DVD-playing programs make it easy to turn your PC or notebook into an entertainment system.

Serdar Yegulalp screen tests five of the finest.

People used to scoff at the idea of watching movies on a computer. But these days a PC without a DVD drive is almost like a car without a radio, and the number of DVD-playing applications on the market is multiplying rapidly.

The current crop of software players offer features that are rarely found in set-top or standalone players, which is why enthusiasts of all levels are turning to the PC alternative. Film buffs can take screenshots from their favourite titles (a feature supported by all the products reviewed here) and easily perform frame-by-frame analysis.

The market for DVD-playing software is surprisingly volatile. A quick Google search turns up over 50 different software players, but most have fallen by the wayside. Licensing fees for the DVD-decoding technology make it almost impossible for freeware DVD players (at least, legally), so the products in this roundup are established commercial packages that won't vanish overnight.

Several key factors of the applications in this Labs Challenge were assessed: value for money, ease of use, plus the availability of unique and truly useful features.

Unfortunately, many of these packages offer "Gold" editions that squeeze in every conceivable feature from DTS decoding to image optimisation (often via plug-ins). Some of these traits are quite valuable, but many of them are just plain frivolous.

Thankfully, many of these programs (like WinDVD and CinePlayer) can be purchased in cheaper, stripped-down editions.

Although many of these applications are bundled with DVD drives, most of them aren't available as standalone retail versions in Australia. However, they can all be downloaded from the Web.

How we tested

We used two test machines for this roundup: a Sony VAIO notebook with a 766MHz Intel Pentium III-M and 256MB of RAM; and a desktop built around an AMD Athlon XP 2400 with 512MB of RAM. For graphics controllers, the Sony had an Intel 82815, while the AMD had an Nvidia GeForce4 Ti 4200. We also tested with both PAL and NTSC discs.



InterVideo WinDVD 5 Platinum

InterVideo's WinDVD was one of the very first DVD-playing apps for the PC, and this version sports several new and unique features.

One of WinDVD's best attributes is its PAL TruSpeed function. PAL DVDs run at 25 frames per second, so film-sourced PAL DVDs play slightly faster than they should, with the audio pitched up by half a

tone. TruSpeed slows PAL video to the correct framerate and

adjusts the audio pitch as well — a great feature if you're a stickler for audio and video quality and you can't use NTSC discs. TruSpeed can be toggled off if you have

PAL discs that are mastered with different timebase correction, or are video-sourced. One strange audio quirk:

the sound often cuts out between chapters.

WinDVD 5 Platinum offers advanced colour-correction options that compensate for darker images or dimmer displays, as well as pre-built colour profiles (for CRTs, video projectors, and so on), or you can customise your own. Additional features include control over de-interlacing, an advanced time compress/expand function for fitting a feature into a given time frame, and even an option to set DVD playback as the desktop's wallpaper.

WinDVD's audio features include direct 24-bit/96kHz audio decoding, Pro Logic II, SRS surround, and 7- and 8-channel soundcard support. The program also has bundled add-on packs that enable DTS and optimise battery use on Centrino notebooks.

An optional add-on pack is available for DVD-Audio playback (US\$39).

A Gold edition of WinDVD 5 is also available. This version omits some display control features (including DivX support and progressive deinterlacing) and audio-decoding options (such as 96kHz/24-bit audio decoding, Dolby Digital EX, Dolby Pro Logic II and DSP audio effects) but it's US\$20 cheaper.

Details	
Contact	InterVideo
Online	www.intervideo.com
Price	Platinum, US\$69.95; Gold, US\$49.95
✓	PAL TruSpeed; optional DVD-Audio pack.
✗	Price; audio breaks at chapter points.
Verdict	●●●●●

CyberLink PowerDVD 5.0 Deluxe

An extremely popular product, PowerDVD 5.0 has all of the great features from the previous editions with some interesting new audio and video-rendering options.

Aside from having an excellent video codec, PowerDVD has a great range of audio controls including: the ability to remix two-channel audio for 5.1 presentation on-the-fly; Dolby Virtual Speaker decoding; built-in DTS decoding (no need for external hardware); and direct output of 24-bit/96kHz LPCM-encoded audio. You can also control the de-interlacing and down-mix or rechannel 5.1 audio. Unfortunately, DVD-Audio playback isn't supported.

PowerDVD 5.0's controls are slightly different to those of previous versions: they're a little sluggish and some buttons behave differently—for example, when

paused, skipping ahead or behind causes the player to resume play.

Also new is the highly configurable multi-display support and the CyberLink Eagle Vision (CLEV) colour-enhancement technology. This adjusts the image gamma and contrast curves to improve playback quality—titles that are uniformly dark come out much better-defined.

CyberLink Pano Vision (CLPV) stretches a 4:3 image to fit a 16:9 display. This stretches the edges of the image with the middle remaining untouched, however the results aren't always palatable.

A Standard edition of PowerDVD (US\$49.95) is also available, although it omits Dolby Virtual Speaker and DTS output.



Details	
Contact	Manacomm
Online	www.manacomm.com.au
Phone	(07) 3720 5555
Price	Standard, \$99.95; Deluxe, \$149.95
✓	Software DTS decoding.
✗	No DVD-Audio playback.
Verdict	●●●●○

Microsoft Windows Media Player 9

As you might have guessed, this is the very same Windows Media Player that's bundled with each copy of Windows. It can't perform DVD-playback by default, but if you have Windows XP you can enable it with the appropriate plug-in. This requires a DVD decoder, available from any of the apps mentioned in this roundup, or as a standalone plug-in. The Windows Media site (www.windowsmedia.com) provides links to three plug-ins from Sonic, InterVideo and CyberLink, which cost US\$15 each.

If your PC is connected to the Net WMP9 scans the All Music Guide for the DVD's metadata and displays the disc cover art and chapter information. Video adjustments are rudimentary (colour, contrast,

brightness), but WMP9 offers some interesting audio filters, such as TruSurround, multiband equalisation and audio compression for noisy environments.

It also lacks some of the other players' more convenient features: It doesn't let you bookmark sections of a DVD, create playlists or resume from a specific point on a disc. You can change the properties for the DVD decoder, but these vary depending on the driver maker.

As the DVD decoder plug-ins are cheaper than the full programs, this is a good place to start for people on a budget. It's also a viable alternative for those who don't want to install an entirely new app to play DVDs.



Details	
Contact	Microsoft Australia
Online	www.windowsmedia.com
Price	Plug-ins start from US\$14.95
✓	Cheap; integrates into existing WMP9 interface.
✗	Not very flexible; few enhancements.
Verdict	●●●○○

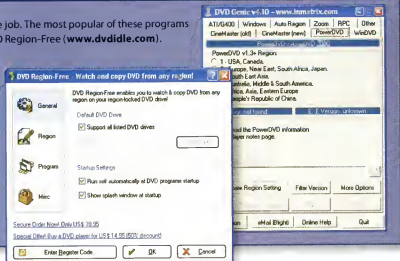
Region hacking

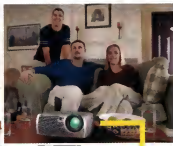
Playing DVDs on a PC is one way to get around region-coding and TV system issues. PC-based DVD software can play PAL and NTSC discs interchangeably and, with a little work, can also play discs from more than one region.

One of the easiest ways to do this is to install a program that changes the region code of any inserted disc to match the region code of the DVD player. This is usually done by installing a special device driver that intercepts calls made to the DVD drive by the program.

Some of these applications may not work with your system or DVD-playing software, but most of them have trial periods that let you determine if they can

do the job. The most popular of these programs is DVD Region-Free (www.dvdfree.com).





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No strings attached

Competition is alive and clicking in the cordless world. Bill Bennett compares the keyboards and mice that do away with cable clutter.

There's a good chance that you're not happy with the mouse and keyboard that came with your PC. Computer manufacturers know these items are essential, but they don't really make or break a sale. So they often bundle low-value, unbranded or out-of-date products, knowing that you won't complain or feel cheated.

And you probably won't. Familiarity breeds contempt, but by the time you realise your mouse is actually a dog, or your keyboard is on the verge of causing an industrial injury, that initial hardware purchase will be ancient history.

The good news is that you don't have to spend a huge amount of money to kit yourself out with a really good desktop combo. Thanks to fierce competition, there's a virtuous cycle of innovation and a decrease in prices. Hardware makers have learnt how to make their products look good too.

Wireless peripherals go hand-in-hand with ergonomics, as they encourage greater mobility and reduce the need to maintain a fixed position. With repetitive strain injuries on the rise, ergonomically-designed keyboards and mice have become the norm rather than the exception. Split-key designs (which divide the keyboard into two halves), raised surfaces and palm rests are all features designed to improve posture and reduce stress on the wrist, arm, shoulder and neck. Additionally, the increased prevalence of scroll wheels, thumb rests and uniquely sculpted designs on mice provide greater support for wrists and fingers.

In the last six months, manufacturers have also addressed the issue of battery life. Until this year, cordless desktop hardware chewed through power cells at an alarming rate. Hardware makers might've claimed their products could run for six weeks on a set of batteries, but heavy users noticed they were buying new cells almost on a weekly basis. Power consumption has improved to the point where cell-replacement schedules are measured in months rather than days. At the same time, rechargers that draw power from a USB source are appearing.

All of the devices in this roundup use RF (Radio Frequency) to transmit signals from the keyboard and mouse to the receiver connected to the PC. Unlike the older IrDA technology, it doesn't require line-of-sight connections, and can also work through doors and walls. Bluetooth is a special type of RF but, as yet, has only been used by a handful of manufacturers for keyboards and mice. While it's more secure than the more conventional RF, complex configuration and a lack of standardisation inhibits its widespread adoption.



Microsoft

Wireless Optical Desktop Elite

When Microsoft refreshed its already strong wireless hardware range in late 2003, the Wireless Optical Desktop Elite emerged as the company's flagship desktop combo. It's expensive, but nevertheless a good buy, particularly for heavy Internet users or those who spend a lot of time working with Microsoft applications. It'll give you less trouble and better all-round service than any other bundle in this roundup, and it even supports the Mac platform.

The recent makeover is evolutionary rather than revolutionary. The new tilt wheel, for example, extends the functionality of the familiar scroll wheel to include left-right scrolling. We have seen this before in offerings from Logitech and even IBM, but that doesn't negate its usefulness.

Microsoft is so proud of this trick that it has included two tilt wheels in the Elite combo. Tilt wheel number one is part of the updated Wireless IntelliMouse Explorer. Its state-of-the-art design won the Editor's Choice award in this month's mouse comparison (page 70). A second tilt wheel sits on the left-hand side of the Elite Keyboard.

These aren't the only new components. Microsoft has revamped its wireless receiver design and updated the software; both IntelliPoint and IntelliType Pro have moved on to version 5. The technology has matured to the point where it works flawlessly and battery life now extends to months rather than weeks.

Microsoft's keyboard looks good and its faux leather wrist rest provides an opulent touch. However, its action is slightly spongier than you'd expect at this price, and touch-typing can be quite noisy. Unusually, the Elite keyboard doesn't have Caps Lock and Num Lock indicators — if \$100 combos have lights to show wireless activity, why can't this one?

Along the keyboard's top row are eight launch and five easily programmable "favourite" buttons, as well as media controls. Most of them perform as you'd expect, but the default setting of the Mail button launches a Hotmail page instead of Outlook.

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Details

Contact	Microsoft
Phone	13 20 58
Online	www.microsoft.com.au
Price	\$229
✓	Good feature set; excellent integration; great mouse.
✗	Indifferent keyboard action.
Verdict	●●●●●



A4 Tech

Rechargeable Wireless Desktop

How much of a cordless combo can you buy for \$70? More than you might imagine. A4 Tech's Rechargeable Wireless Desktop features a fully-functional wireless keyboard and an adequate wireless optical mouse for less than you'd normally pay for just a mouse.

As you might expect, it's not particularly feature-rich or elegant, but this has an upside. While A4Tech's plain-looking optical mouse barely nods in the direction of ergonomics, it's a blessing for southpaws who don't have to contend with designs sculpted for right-handers.

While the mouse only has three buttons (compared with eight on some rivals), it boasts a scroll wheel, and its 800dpi optical sensor resolution makes for a smooth experience.

Unfortunately the keyboard doesn't fare as well. It's a three-quarter-sized unit, with slightly cramped keys. Normally this wouldn't matter — laptop keyboards are even smaller — but the keys are arranged in an odd A-shape. A4 Tech claims this is an ergonomic design, which may well be the case, but it sure makes touch-typing difficult.

A row of 16 labelled launch keys runs across the top — they're small but they work well. Reprogramming is easy, and can be done using A4 Tech's IKeyWorks 6.12 software, which surprisingly comes supplied on a single 3.5in floppy disk. Owners of newer systems without floppy drives can download the program from A4 Tech's Web site.

You won't have any difficulty getting this combo to work with older computer systems. It supports just about every version of Windows from 95 to XP Professional, but not the Mac. One potential snag is that the base receiver requires twin PS/2 ports — something you don't often see these days. The base station isn't pretty either, doubling as a battery recharge station where cells sit under a clear plastic lid.

Details	▶▶
Contact	AnyWare
Phone	(02) 9879 5788
Online	www.anyware.com.au
Price	\$70
✓	Cheap.
✗	Touch-typing difficult.
Verdict	●●●○

Belkin

Wireless Keyboard and Optical Mouse

Belkin's Wireless Keyboard and Optical Mouse can't be described as as fancy or polished, yet its designers have cut fewer corners than you might expect at this price.

If you're determined to lose those desktop cables and you're on a tight budget, this is a plausible option for business applications, but it doesn't quite cut the mustard for gamers.

While the three-button wireless optical mouse with scroll wheel is perfectly serviceable, its symmetrical design and lack of sculpted contours makes it a good choice for left-handed users.

Belkin's keyboard is almost as good as those found in more expensive combos. It's based on the membrane technology used by manufacturers to build quiet notebook keyboards with minimal travel.

In practice, it certainly feels like you're typing on a portable machine, though there's a lot more room; in fact, the keys are marginally less crowded than on Microsoft's upmarket Elite. While the keyboard itself is sturdy enough to take a good pounding from a manual typewriter-trained touch typist, the same can't be said about the detachable, flexible wrist rest.

Like most other wireless keyboards, the Belkin has a row of launch buttons along the top edge. However, unlike rival models, these don't appear to be programmable and some don't work at all in Windows 98. If you happen to use the wrong applications — say Mozilla instead of Internet Explorer — you simply run up against a brick wall. There are no indicators for Num or Caps Lock, but a flashing green LCD tells you when there's wireless activity — a great troubleshooting aid.

But you probably won't need to do much fiddling — in our tests, the Belkin combo works first time straight out of the box, and continues to work without a hitch.

Apple users are out of luck, though, as no support is provided for that operating system.

Details	▶▶
Contact	Belkin
Phone	1800 666 040
Online	www.belkin.com/anz
Price	\$100
✓	Great value, suitable for left-handers.
✗	No customisation.
Verdict	●●●○



Logitech Cordless MX Duo

Logitech doesn't promote its Cordless MX Duo as a wireless combo for gamers, but that's what this pairing of the company's top-ranking MX700 optical mouse with the Elite keyboard amounts to.

Thanks to an RF link, the MX700 sends data to a computer twice as fast as other wireless mice. This is barely noticeable during regular use, but it makes a huge difference to games that are graphics-intensive.

Logitech's Cordless Elite keyboard doesn't match the quality or performance of the MX700. It can't transmit at the same speed or make use of the handy mouse battery recharger in the base station receiver.

While it's not a great business keyboard, it more than passes muster for multimedia applications and games.

When placed on a desk or tabletop, the keyboard lays dead flat. Although flat keyboards can work for touch typists, this one feels dead and the case too flimsy. On the other hand, it suits gamers that hold the keyboard in their hands or sit with it on their laps.

Another clue that the keyboard was designed to be held is the scroll wheel on the far left edge. It's difficult to use the wheel with the keyboard sitting on a desk, but when you hold it, rolling the wheel with your left thumb is easy.

Logitech's selection of launch keys and the oversized media control section dominating the centre of the keyboard underline the combo's after-hours orientation.

In fact, some launch keys reflect Logitech's commercial needs more accurately than any well-researched assessment of user requirements; for example, a shopping key takes users to eBay, but there's no cut or paste keys.

Another key links you "directly to your Logitech webcam". They're all re-programmable, but in reality most users stick to the default options.

Details	
Contact	Logitech
Phone	(02) 9972 3711
Online	www.logitech.com
Price	\$229
✓	Good mouse, suitable for gamers.
✗	Disappointing keyboard.
Verdict	●●●○○



Logitech Cordless Comfort Duo

Eliminating cables is all good and well, but for many people suffering from carpal tunnel syndrome and similar computer-inflicted conditions, a more pressing goal is to reduce the pain of using keyboards and mice.

Logitech has targeted both these needs with its Cordless Comfort Duo, a combination offering made up of the ergonomically-friendly Cordless Desktop Pro keyboard and the Cordless MouseMan Optical mouse.

The Cordless Desktop Pro is a split keyboard. The theory behind the design says that typing on a conventional keyboard twists your hands into unnatural positions and that this action leads to problems.

To get around this, the keyboard is arranged in a three dimensional layout so that your hands stay in a less stressful position. While there's some benefit from the split layout, that the wrist rest makes more of a difference than the split.

Some split keyboards allow you to adjust the angle. This keyboard is fixed in one position, but it can be tilted. Users still need to twist their hands to use the launch buttons at the top of the keyboard — but experienced keyboarders rarely use these buttons anyway.

Because the keyboard doesn't have any rubber pads, it has the tendency to slide over a smooth desktop. This is a problem for touch-typists in particular, as the keyboard moves with almost every keystroke.

It's debatable whether the Cordless MouseMan Optical is the most ergonomic mouse in Logitech's range; it certainly isn't as comfortable as Microsoft's Wireless IntelliMouse Explorer. What's more, it's highly asymmetric, so left-handed users won't feel too comfortable. The mouse responds poorly — in fact, it has the worst response of all the mice in this roundup.

Details	
Contact	Logitech
Phone	(02) 9972 3711
Online	www.logitech.com
Price	\$229
✓	Ergonomic keyboard.
✗	Poor mouse response.
Verdict	●●○○○



Logitech

diNovo Media Desktop

Logitech's diNovo Media Desktop looks gorgeous, but for \$499 it ought to. At a time when you can buy a functional PC for less than \$1,000, it might seem ridiculous to pay half that amount for even a high-end wireless desktop.

But make no mistake; people will want the diNovo, even if they can't afford it. This would've been our Editor's Choice winner, but the price is hard for most folk to justify. Then again, "most folk" aren't the target audience for the desirable diNovo Media Desktop.

Wireless desktops usually include a keyboard, a mouse and a base station. The diNovo has all three and adds what Logitech calls a MediaPad. This functions as a wireless numeric keypad, a computer-connected calculator and as a Bluetooth-enabled remote control unit. It has a three-line monochrome LCD display that alerts you when email arrives. You can use it to tee up songs through the Windows Media Player or control other Bluetooth-enabled media hardware.

Unfortunately, the MediaPad is fractionally larger than is comfortable and its display isn't backlit, making it hard to read in darker environments.

The keyboard and MediaPad are very thin, about 10mm with a top edge that rises to 20mm. Nevertheless, they're solid and can take a hammering during gameplay or typing. It is by far the best keyboard in this roundup.

The bundled MX900 mouse is a Bluetooth version of the MX700 (reviewed on page 68). It works just as smoothly and also uses the base station as a battery charger.

Installation is surprisingly easy considering the clumsiness of other Bluetooth desktops. A clearly printed instruction sheet is provided, and no reboot is required. The entire procedure takes about 40 minutes, but users will have a working mouse and keyboard within 10.

Details >>>	
Contact	Logitech
Phone	(02) 9972 3711
Online	www.logitech.com
Price	\$499
✓	Innovative, makes Bluetooth easy; MediaPad.
✗	Expensive.
Verdict	●●●○

Microsoft

Wireless Optical Desktop for Bluetooth

You simply won't find a better keyboard or mouse than the elegant Wireless Optical Desktop for Bluetooth. Both devices feel as good as they look and the keyboard works equally well on a desk, in your hands or on your lap.

Yet despite the quality and pedigree of the two core components, it's seriously flawed in a number of important departments. For a start, the Optical Desktop for Bluetooth is hellishly difficult to set up. It takes longer to install and test this single product than all the other products in this roundup put together. The whole process requires several reboots and there's precious little information to tell you what's going on at each stage. Additionally, Microsoft's Bluetooth implementation only works with Windows XP Service Pack 1.

The whole idea of using a Bluetooth setup on a PC is that once the connection is established, you can quickly and easily connect other Bluetooth devices to your PC. That's the theory anyway — in practice there are limitations on your options. In some cases, the keyboard and mouse actually stop operating if non-Microsoft compatible Bluetooth devices move into range.

Another problem is that the keyboard doesn't actually start functioning until Windows has finished loading — meaning you can't switch to BIOS, hit function keys or boot directly from a CD when your system starts up.

Although Bluetooth has a peak transfer rate of 1MB/s, this combo's overall performance fares no better than the 27MHz RF alternatives. In fact, it appears to be less responsive than Microsoft's conventional wireless offerings.

Finally, this is the most battery-sapping combination in this roundup. If you're lucky, you'll get about a week of use from a set of cells.

Overall, the high price isn't really reflected in either the performance or functionality.

Details >>>	
Contact	Microsoft
Phone	13 20 58
Online	www.microsoft.com.au
Price	\$350
✓	Good look and feel.
✗	Too difficult; limited Bluetooth support.
Verdict	●●●○

Optical illusions

Cutting the cord is cool, but it's not the only reason to buy a new mouse. Optical sensors and trackballs are speeding up things on the desktop.

Trading up to a wireless model engineered for increased efficiency or improved ergonomics means you can kick-start your productivity, relieve discomfort and reduce desktop clutter.

All the mice and the single trackball in this roundup use optical sensors, greatly improving usability. They are more reliable, accurate and smoother than mechanical devices — working on most surfaces and requiring little maintenance. Manufacturers have also increased the sampling resolution of these sensors, so

modern models tend to be even better.

Ergonomic designs with sculpted bodies and finger or thumb rests abound. You could take these designs for granted, however, comfort greatly depends on the size of your hands so you may have to test drive a few mice to find what works best for you.

Despite this emphasis on strain-free mousing, manufacturers still have something of a blind spot for left-handers. These users have to choose between wrestling with right-hand designs, compromising on features or paying a premium to a specialist retailer.

Cordless mice aren't without drawbacks. Most wireless links transmit data at 60Hz — much slower than conventional mice, although Logitech's latest batch overcome this problem with a faster data transmission speed of 125Hz.

Microsoft

Wireless Intellimouse Explorer

You might think that Microsoft's recent tweaks to its already brilliant Wireless IntelliMouse Explorer are little more than cosmetic changes. For example, the sculpting on the top of the case now has two slight recesses for the index and middle fingers.

But the real changes quickly become apparent the moment you use the mouse. The new tilt wheel is a genuine improvement — it's a scroll wheel that allows users to scroll side-to-side through a document

or Web page.

This is an entirely natural and intuitive action — once you've used it, you won't want to go back to a non-tilting mouse wheel. Microsoft has also cleaned up the wheel's scroll action by removing the clicking and increasing resistance. The company also claims that changes to the way the mouse consumes power means owners should get six months' use from a set of batteries.

Microsoft's latest mice all have excellent ergonomics, but the latest Wireless IntelliMouse is a lot more comfortable than the company's USB offerings. The battery also adds some weight, actually improving the feel.

While this device can't match the raw performance of Logitech's offerings, this is only an issue when it comes to meeting the needs of those inclined to play fast action games.



Details ▶▶▶	
Contact	Microsoft
Phone	13 20 58
Online	www.microsoft.com.au
Price	\$130
✓	Ergonomic; tilt wheel; integration.
✗	Sluggish gaming performance.
Verdict	●●●●●

A4 Tech

Office 8K

While other cordless mice hide the complexity of wireless communication and configuration behind a software interface, the A4 Tech Office 8K forces users to put in more effort than expected. During installation, for example, users have to set channels and ID codes.

There's a clear pay-off here, but it isn't just between price and functionality. The added intricacy allows the Office 8K mouse and its eight programmable buttons to be configured exactly the way you want.

Physically, the mouse is almost identical to Logitech's MX700, with only a few buttons in different positions. And surface looks aren't the only thing the two mice have in common; the Office 8K also has an RF base station that doubles as a charger. But that's where resemblances end. The Office 8K has four rechargeable cells; two for the mouse, two for the charger.

The Office 8K's button customisation requires a particular mindset. If you're happy remembering the 24 different ways to combine buttons — each set triggering a different function — then this mouse will suit you to a tee. Otherwise, life might simpler elsewhere.



Details ▶▶▶	
Contact	AnyWare
Phone	(02) 9879 5788
Online	www.anyware.com.au
Price	\$65
✓	Flexible; low cost.
✗	Complex setup
Verdict	●●●●○

Logitech

Cordless Click! Plus Optical Mouse

If you're tempted by the fast radio frequency and high-resolution optical sensor technologies in the MX700, but can't stomach the hefty price tag, Logitech's Cordless Click! Plus Optical Mouse might meet your requirements.

The two mice share a similar shape, though the Click! Plus is missing the MX700's cruise control buttons, and the thumb navigation buttons have been shifted to a marginally less accessible position. Clicking the rear thumb button requires extra concentration.

A more significant difference between the lower cost model and Logitech's flagship mouse is that the Click! Plus relies on conventional batteries instead of a charger.

The Click! Plus delivers excellent performance. The mouse's 125Hz refresh rate and 800dpi resolution, together with rubber pads on the base, means it never misses a beat. Overall responsiveness is

fractionally behind the more expensive MX700. Most of the time you won't notice this, but it could make a difference if you're pushing performance to the limit with a graphics-intensive game.

Logitech's MouseWare lacks the slick integration of Microsoft's IntelliPoint, resulting in errors during installation. This can be forgiven, but the tacky marketing rubbish that's loaded onto your system what can't be ignored.



Details	
Contact	Logitech
Phone	(02) 9972 3711
Online	www.logitech.com
Price	\$99
✓	Fast refresh, high resolution.
✗	Tacky and disruptive software.
Verdict	●●●●○

Logitech

Cordless Optical TrackMan

Does the world really need a cordless trackball? Wireless mice make sense because their cables can snag as they roam across the desktop. Trackballs, on the other hand, tend to stay in the one spot.

Given that the Logitech Cordless Optical TrackMan trails around a metre of cable between its USB or PS/2 connector and the receiver unit, cutting out those few remaining centimetres barely seems adequate compensation for the trouble of regularly replacing the unit's batteries. And to cap it all off, the wireless signal only has a two-metre range, which hinders any long distance operation.

These considerations aside, this device works rather well and doesn't cut out or skip — as long as the trackball stays close to the receiver.

Physically, the TrackMan is larger than a standard mouse. It has eight buttons, including one on the scroll wheel and five of these

buttons can be easily be reached without moving or twisting. In practice, the three buttons surrounding the scroll wheel are too small for comfort.

Optical trackballs tend to be very sensitive and this model is no exception. It gives more precise control than most mice and only requires a light touch.



Details	
Contact	Logitech
Phone	(02) 9972 3711
Online	www.logitech.com
Price	\$149
✓	Accurate.
✗	Expensive, limited range.
Verdict	●●○○○

Logitech

MX700 Cordless Optical Mouse

With its 4.7 megapixel per second, 800dpi optical sensor and fast wireless link, Logitech's MX700 beats all other mice in terms of raw performance. Whether this translates into something important depends on what you're after.

Logitech's fast radio frequency connection allows the mouse to refresh at 125Hz — about twice the speed of rival cordless mice — and works up to 12m away from the base station.

Another notable feature is that you can put the mouse in the RF base station to recharge its batteries. Although you can generally expect to get months from a single set of AA cells in other cordless mice, this adds an extra level of convenience.

This device has six buttons in total, including one on the scroll wheel. In normal use, two thumb buttons will move you through Web pages, and buttons on either side of the scroll wheel act as

"cruise control" to scroll up and down the screen. All buttons are programmable, but the MX700 remains a strictly right-handed mouse.

Of course, high-performance cordless mice aren't exactly essential for everyday computing. However, if you play graphic-intensive games the MX700 delivers the necessary responsiveness.



Details	
Contact	Logitech
Phone	(02) 9972 3711
Online	www.logitech.com
Price	\$159
✓	Performance, recharger.
✗	Expensive; right-hand only.
Verdict	●●●●○



What Bill did next...

You've read the rumours — now get the real deal on "Longhorn", the successor to Windows XP. Matt Overington and David Flynn report.

After a year of wild speculation, fuelled by leaked alpha code and a gaggle of gossiping Web sites, Longhorn is finally out of the corral. Microsoft lifted the covers off the successor to Windows XP at its annual Professional Developer's Conference, held in late October 2003 under a smoky Los Angeles haze from the fires blazing in nearby San Bernardino. APC was there to bring you this scoop on the software that will probably become Windows 2006, and which will almost certainly be your next OS.

Longhorn is in the early "alpha" stages of its lifecycle, with the finished OS still a glimmer on the horizon. Pundits are now forecasting it'll arrive in the second half of 2006, a slippage of some two years from Microsoft's earliest pencilled-in predictions. But, from what we've seen, Longhorn should be worth the long wait.

This time last year we gave you a first look at Longhorn with our preview of the Milestone 3 alpha build (APC, January 2003), detailing the interface concepts and the underlying technologies that will shape the OS.

This update is based on the special PDC Edition (alpha build 40S1), which came neatly packaged in a little black book labelled simply "The Goods", which was released into the clutching claws of some 7,500 code-cutters at the conference. Microsoft has subsequently made the PDC build available to subscribers of its MSDN development network.

For software in such an early stage of gestation, this high-profile exposure is unheard of. Like most vendors, Microsoft traditionally plays a closely-guarded hand until the first beta release, at which point it starts cranking up the pre-release hype. But the Longhorn marketing machine is already on overdrive. The OS is being handed out like chocolates on the Cadbury factory tour. It also has its own official Web site (<http://msdn.microsoft.com/longhorn>) which in turn provides links to an extensive set of Weblogs maintained by a community of developers, users and advocates.

It's a clever strategy: eliminate the impact and spread of random leaks by issuing sanctified builds on a coordinated schedule; get the programming community in the Longhorn loop so it can start coding the software that will help sell the OS; and use the new features and capabilities introduced in each milestone build to keep consumer interest bubbling away.

The PDC Edition is a perfect example of this tactic. It lacks several key features, such as the effects-laden interface with which Microsoft hopes to out-glam Apple. The party line is that its bells and whistles were excised to prevent competitors (especially the Jolt-fuelled Linux camp) from quickly aping the code and beating Microsoft to the ball. We think it was more that these bedazzling bits of eye-candy weren't ready for prime time, and expect them to surface with the beta 1 release due in late 2004. Even then, rest assured that the interface can and will change. Longhorn is very much a work in progress.

What is set in place are the underpinnings on which the OS will be built. They reveal a sweeping architectural overhaul of the Windows platform, which has significance not only to the developers but those of us who'll end up running Longhorn.

So our second-stage report on Longhorn is as much about the guts as the GUI. With so much misinformation circulating, we've plumbed the depths of Longhorn to bring you the real deal.

For starters, the new WinFS file system doesn't replace NTFS — so you don't need to start saving in order to replace all your favourite applications. And the interface remains largely the same as Windows XP, although new elements such as the Sidebar raise the possibility that the standalone Start button and Taskbar may eventually become redundant for most users.

And don't bother downloading a copy of the PDC build, which will by now be scattered across the Net, from warez sites and secret FTP servers to P2P networks. The code is unstable, performance is slow, features are missing and the interface is rough around the edges. Take it from us: Longhorn will not run on your current PC. It'll limp, it'll stagger, but it certainly won't run.

The official recommended system for build 4051 is an 800MHz Pentium III with 256MB of RAM and a DirectX7-compatible video card. Microsoft forgot to say that you'll also need a pair of rose-coloured glasses, because even if you could get Longhorn to boot on such a box, the final code would probably be shipping by the time the Windows startup sound eventually issued forth from your speakers.

When loaded onto our muscle-bound test bench box — a Shuttle XPC with 3GHz Pentium 4 processor, 1GB of RAM and a 128MB Radeon 9800 Pro video card — the system was barely able to keep up with even the most basic tasks.

Before you start bleating accusations of Microsoft "bloatware", remember that Longhorn is perhaps one year away from even the initial beta release. The PDC Edition is an alpha build, so it's not designed for performance, fit or finish. The architecture is far from complete and the OS is laced with bug-trapping code. Build 4051 is "proof of concept" stuff as much as anything else.

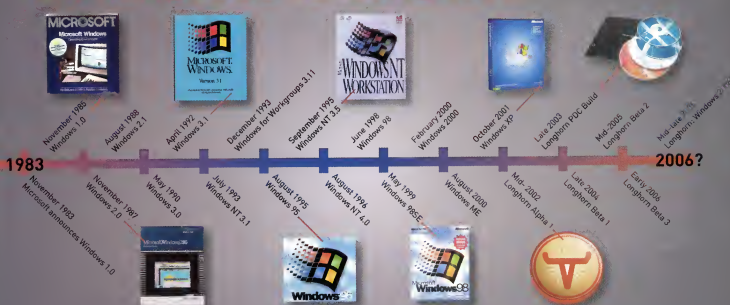
Not only will Microsoft optimise the OS and boost performance with each milestone release, but by the time Longhorn hits the shelves in late 2006, the average desktop processor will clock at close to 5GHz, 2GB of RAM will be considered the norm, and the fast-lane PCI Express interface will turbo-charge graphics. To put it in clearer perspective, our 3GHz Pentium 4 test machine will be two generations out of date and comparable to a 300MHz Pentium II today.

UP AND RUNNING

The setup process for Longhorn has been refined from XP. Microsoft has finally realised that mums and dads all over the world will be loading the OS onto home machines, so they've ditched the blue and white installation screens for a slicker graphical setup routine. The installer also includes an elegant partitioning tool, a feature glaringly absent from and sorely missed in previous versions of Windows. The hardware detection process was very slow — it took over an hour on our test machine, although in the end it successfully sniffed out all the hardware on board.



The long road to Longhorn



WINFX AND INDIGO

On the surface there's little difference between the PDC Edition and the earlier alpha builds. The slicker look could as easily be a skinned version of Windows XP with a few fancy shareware add-ons. But there's plenty going on under the bonnet. Longhorn stands to be the most significant release of Windows since the upgrade from Windows 3.11 to Windows 95.

Central to this is the new application programming interface (API) called WinFX, which ushers in many new features and concepts. WinFX is based on the .NET framework, which shifts .NET onto centre stage for Windows programming and should see the merging of application development and Web development.

Because WinFX runs in "managed" code that's monitored by the OS, it can safely be exposed to scripting languages running over the Web. That said, one of the criticisms of managed code is that it removes the ability to perform "API-hooking". This technique enables programmers

to link from existing APIs to their own, in order to change the way the core OS behaves — typically to extend and customise the Windows platform. For instance, if you don't like the way scrollbars are rendered, you can hook in another API to change the way it works. This means that skinning of the OS will be restricted to the functions that Microsoft dictates will be available. On the plus side, API-hooking increases the security risk as the operating system can't manage code designed to damage the system.

Another step towards .NET is Indigo, the codename for Longhorn's new Web services framework. Ever since the introduction of the .NET platform, Microsoft has been working towards breaking down the barriers between developing applications for the desktop and the Web — a massive change to the conventional programming model.

For a real-world example of what the Indigo API can do, one of the PDC presenters whipped up an applet to publish text from the Windows desktop to a blog in a matter of minutes. Impressive stuff!

WINFS

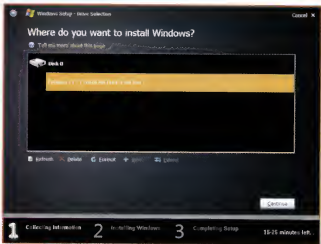
For more than 12 months, one of the most widely discussed components of Longhorn has been Windows Future Storage. When WinFS first surfaced it was touted to be a new file system which would replace the current FAT and NTFS technologies which underpin Windows 9x and Windows XP/2000 respectively.

When the wraps came off WinFS at the PDC, Microsoft confirmed that WinFS is not a replacement for NTFS. Instead, it's a service that will sit atop the file system and interact with it. Quentin Clark, Microsoft's Director of Program Management for WinFS, explained to APC that as Microsoft has a significant investment in NTFS, replacing it would mean a large amount of unnecessary development.

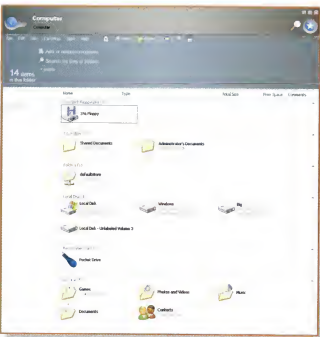
The role of WinFS is to transform Windows' conventional flat structure of drives, folders and files into a database which can be



► **The adventure begins:** The PDC Edition of Longhorn reveals on improved graphical installer to simplify the setup process.



► **Slice and dice:** Another win for beginners is the graphical portioning tool which has been added to the revamped install routine.



► **A place for everything:** The sleek interface (shown here running under Longhorn's Slate theme) features a new layout for the My Computer window.

queried just as an Internet user might employ Google to locate a Web page. WinFS sits between the application layer and the file system — it uses metadata descriptors to sort, store and search for files in a virtual database built on NTFS.

This means that current Windows XP applications will be compatible with Longhorn, although we expect that new versions of programs that follow Longhorn's release will take full advantage of what WinFS has to offer — in much the same way that Windows 95 could run most Windows 3.x applications, but worked best with those rewritten specifically for the later OS.

WinFS grew out of research conducted by Microsoft's database team during the development of the as-yet unreleased SQL Server 2004, codenamed "Yukon". WinFS uses the same technology as Yukon to store and query database entries, although Longhorn won't include a stripped-down version of the Yukon engine, as previously suggested.

The 4051 build already ships with schemas for dealing with some data types, including pictures, songs, and contacts; programmers can create more as desired. Users can add metadata tags to photos and include details such as when the shot was taken, where it was taken, and who appears in the picture. This will allow users to ask Longhorn to display all holiday snaps taken in Canada between 1998 and 2001, for example, or all photos containing your girlfriend — tasks that are impossible using NTFS alone. And because the search subsystem runs through the database instead of the entire file allocation table, the query is almost instantaneous.

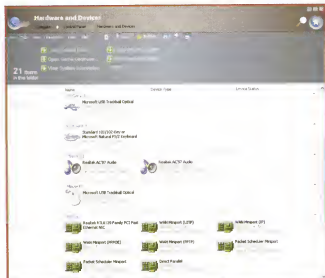
An extension of this is that users won't have to worry about filing their work away in neatly nested and meticulously ordered folders — not that many of us do anyway — but in Longhorn you won't have to feel bad about being disorganised and treating your hard drive like a digital shoebox. Nor will you pay for your shambolic tendencies by spending minutes digging around for a particular file which isn't sitting where logic suggests it should be — WinFS queries can be made on all types of documents on local drives or across networks.

The WinFS database also enables a new file management concept called Libraries. Libraries consist of a set of grouped folders which are treated as a whole. The Music Library, for example, contains every audio file on the system. Using Libraries in conjunction with Longhorn's filtering technology makes it much quicker to find files littered across countless folders and multiple hard drives.

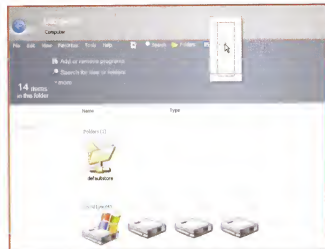
As admirable as Longhorn's database file system is, don't be blindsided into thinking of it as a Microsoft innovation — this same feature was among the many strong points of the BeOS operating system, which dates back to the mid-'90s. But, with Longhorn, it enters the mainstream arena, and will radically improve the way we deal with data.

AVALON

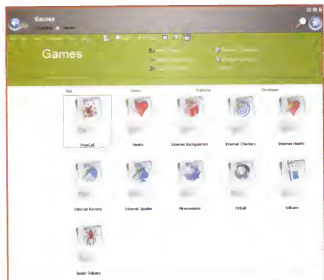
The foundation for the entire Longhorn user interface is Avalon, which is the part of the Windows API set that provides the GUI framework.



► **Hardware heaven:** A new view for hardware and devices that breaks the system components down by category and includes links to related folders and services.



► **Upsize it:** Windows Longhorn sports a slider for adjusting the size of icons in Explorer windows.



► **Bye bye bitmap:** Here's a peek at Longhorn's first set of scalable icons, from the Games folder. Other program folders and apps will follow suit.

Avalon handles the presentation of data onscreen, and incorporates native OS support for handwriting and speech recognition.

One of the biggest differences between the current Win32 graphics system and that found in Longhorn lies in modifications made to its screen rendering technique. Whereas Windows XP and its predecessors rely on a bitmap-centric graphics driver interface (GDI) to paint pixels onto the screen, Longhorn's display engine is the quick-on-the-draw, vector-based DirectX. The results are both flashier and faster than anything possible under Windows today.

Longhorn can also shunt screen drawing responsibilities from your system's CPU to the graphics processing unit, which is an impressive win for power users with muscle-bound video cards that see little use outside of gaming and graphics-intensive applications.

This opens a whole new world of visual possibilities, such as transparency effects, plus pixel and vertex shaders. Ironically, many companies experimented with moving drawing functions away from the CPU onto specialised video cards during the 1980s, when processors were relatively expensive yet severely underpowered. Who'd have thought that 20 years later, Microsoft's engineers would return to those same roots?

AERO

Sitting atop the Avalon framework is the graphical user interface itself, which in Longhorn goes under the moniker of Aero. While Aero itself isn't included with the PDC build of Longhorn, littered throughout the OS are hints on how Aero will work. For example, all icons used in Explorer windows are scalable; they're currently versions of the old bitmap icons, but when Aero makes its appearance (expected in the mid-2004 beta 1 build) these will be replaced by photo-realistic vector icons. Yes, just like the ones already available in Mac OS X!

Until Aero touches down, Longhorn is making do with a placeholder UI, which is why APC continually cautions against treating the Longhorn look as if it's a done deal. It's far from finished — in fact,

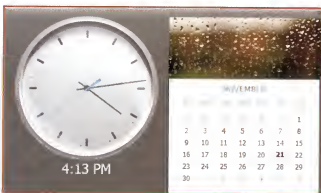
of all Longhorn's components, the look of the interface is the one likely to undergo the most change.

But we'll say this: we're glad Microsoft's developers were quick to ditch the try-hard Plex theme of the early alpha milestone builds. The default 4051 theme is called Slate, an elegant grey metallic version of Windows XP's Luna theme.

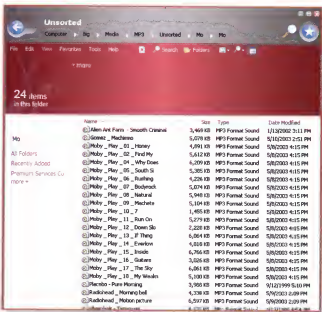
What won't change will be the essentials of the Windows interface. By the time Longhorn ships, the user interface introduced in Windows 95 will have been with us for over 10 years. And while later versions of the OS have streamlined the usability and enhanced the visuals, the core elements of that UI have remained unchanged — in fact, they've been aped by most major Linux distros and even had elements appropriated by Apple (such as OS X's Dock).

SIDEBAR

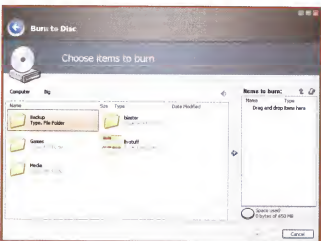
Longhorn's major contribution to the evolution of the Windows user interface will be the Sidebar, which sits on the right side of the desktop (but can be moved to the left, top or bottom if preferred). As shown in previous builds, the Sidebar consists of a series of task-specific modules called Tiles which can do anything from launching your most-used applications and displaying your daily appointment



Time on my side: Longhorn's Sidebar uses plug-in tiles written in the XAML language, but this clock and calendar is currently the most prominent feature.



Filtration system: Start typing the name of a file in the Explorer's new "Filter" box and the files displayed are whittled down to show only those that match.



Files on fire: The new CD burning dialogue is a significant improvement over that offered in Windows XP.

calendar to indicating which of your IM chat pals are online, and even run a mini slideshow of digital photos.

The best indicator of what the Sidebar will become is its older sibling, the Dashboard centre of the MSN 8 software used by the Microsoft-owned ISP service (not available in Australia). As you'd expect from an ISP front end, Dashboard is heavily reliant on live Internet feeds — everything from appointments in your online calendar to images sent by Web cams, share prices, news, weather and sports tickers. With broadband access in the US having already overtaken dialup, a trend line being echoed around the world, Longhorn will come with the expectation that the user has a fast and always-on pipeline to the Net.

The Tiles which shipped with build 4051 include an analog clock, calendar, the photo gallery slideshow and a tool for synchronising data with a mobile device.

Several features of Longhorn's Sidebar supplant the role of both the Start menu and the Taskbar. For example, a Quick Launch panel

duplicates the icons of the Taskbar's Quick Launch toolbar (which itself short-circuits some of the Start menu's functionality), and there's a tray which performs the same function as the System Tray to the far right of the Taskbar.

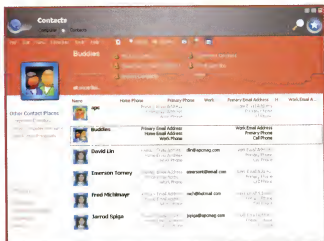
Both of those old faithful Windows elements remain in build 4051, of course, and there's not been even a whisper that they might go the way of the dodo — we expect Microsoft will promote the Sidebar as a complementary tool. Yet you'd only need to add a series of horizontal buttons, each representing an open application, to the Sidebar and you could do away with the Taskbar altogether. Nail on a Start button with slide-down or fly-out program groups and you can see how the Sidebar could totally usurp these elements in a GUI coup d'état.

Crafting these items would pose little problem, as Microsoft is encouraging developers to write their own Tiles which will snap onto the Sidebar just as easily as the standard-issue Tiles can be plugged in and removed. Tiles are written in a new Microsoft-developed derivative of XML called XAML (Transaction Authority Markup Language), which is central to many of the other features afforded by the Avalon GUI framework.

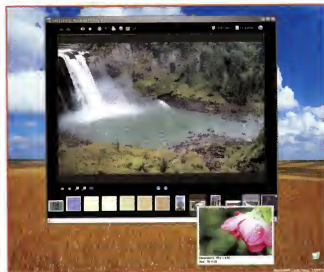
While HTML is great at displaying flat Web pages, and XML is useful for moving data between these pages (as well as between applications), XAML combines the two and ties into Microsoft's .NET technologies. The result is a blurring of the lines between application development and Web development, with XAML being used to create feature-rich applications that can run locally or make use of Web services (for more on XAML, visit www.xaml.org). Already on Microsoft's to-do list for Tiles in future Longhorn releases are an RSS news aggregator and a drop-down contact list.

We attempted to write some of our own XAML Tiles, but at this stage of development, the Sidebar is unstable and prone to crashing. That doesn't concern us, as this is still an alpha release, but we're certainly looking forward to playing with a more mature Sidebar in future releases.

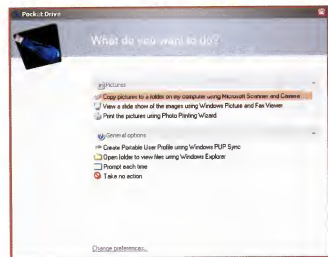
The Sidebar also stakes quite a claim on desktop real estate, occupying about one-sixth of a 1280 x 1024 pixel screen. Microsoft is



► **Calling all contacts:** Longhorn's WinFS database system stores and shows all types of information, including this unified view of your contacts.



► **Eye for detail:** The Image Viewer now does much more than just show pictures, thanks to basic tools that can adjust exposure or remove red-eye effects.



► **Drive in service:** Longhorn includes a redesigned dialog box for dealing with memory keys, which have become enormously popular since the debut of XP.

obviously banking on significant uptake of widescreen displays as the date for Longhorn's debut draws nearer.

We also noticed several changes once you step away from the Sidebar and start rummaging around. Users can type part of a filename or metadata description into a "filter" box in the Windows Explorer and the files shown will be winnowed down to suit. This happens in real time, so as you type each letter the list gets shorter and more accurate. For example, open a folder containing thousands of MP3 files, type "Beatles" in the filter box and you'll see only the songs of the Fab Four. By typing into the filter field you're actually running and refining a search in the Longhorn file system database, making this a practical illustration of how useful WinFS will be. In another step away from the model of paths, folders and files, Explorer windows lose the address boxes and gain quick links to the type of media in the folder.

Microsoft has ramped up the imaging side of Longhorn, adding a handy zoom feature to Paint plus red-eye reduction and numerous quick-fix tools to the Image Viewer, lifting this applet a step closer to the capabilities of entry-level programs like Photoshop Album.

IE AND OE UPDATES

Also beefed up in the Longhorn bundle is version 6.05 of Internet Explorer, which finally catches up to many of its competitors by adding pop-up ad blocking and a download manager. Outlook Express 7.0 adds a handy wizard to automatically detect your ISP's settings based on the email address you enter, to make it even faster for novices to set up their email.

The IE and OE updates are expected to be rolled into Windows XP Service Pack 2, due late 2004. They'll be accompanied by a fine-tuned firewall which, as it is in Longhorn, will be turned on by default. We were amused to find that the default settings for this were so high that we couldn't see other computers on the network until the firewall was disabled. Worried that Microsoft had perhaps gone overboard

in providing a secure OS by locking out the rest of the world, we've been assured that "protection through isolation" isn't Microsoft's new approach to security, and this quirk has been added to the list of things to be fixed.

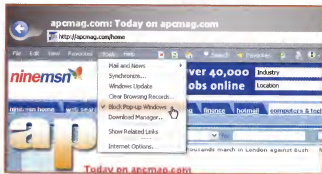
PALLADIUM

Microsoft has deservedly taken plenty of flak for Windows' plentiful and woeful security holes. As broadband access becomes more pervasive at home, and companies shift more of their business processes online, locking down the OS can no longer be treated as anything but a top priority. As with so many other parts of Longhorn, it's impossible for us to make a realistic assessment of its security from this very early alpha release. But we can explain how Microsoft hopes to make Longhorn an OS you can trust.

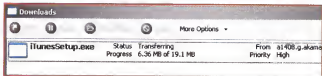
The cornerstone of this is Microsoft's Next-Generation Secure Computing Base (NGSCB) initiative, formerly known by the far shorter and catchier codename of Palladium. NGSCB ties together hardware and software to provide a more secure environment than is possible in the current software-only world.

Joining the CPU and GPU will be a dedicated processor called the Trusted Platform Model, although as yet there's no word on which chip maker will supply the silicon. The TPM chip performs cryptographic functions and stores keys and hashes, which are the elementary building blocks of encryption. Each key is a password that deciphers encrypted data; a hash is a number generated by passing a text string through an algorithm. Any string will generate a unique hash, and this can be used to check the authenticity of information. If a sender transmits both the hash and the original text string, the receiver can run the string through the same algorithm and compare hashes. If the two hashes are the same, the text hasn't been tampered with. It's vital that keys and hashes remain secure.

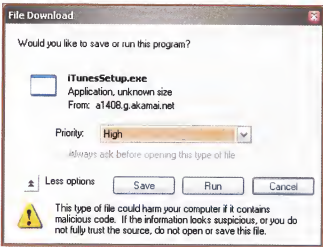
In addition, a software component called a "nexus" manages application processes known as nexus computing agents (NCAs). The key to the model lies in two separate operating modes for Windows, dubbed standard and nexus. In standard mode, Windows functions as usual, and users can run applications without interference. In



▶ **Slapping down pop-ups:** Internet Explorer finally catches up to the competition with this pop-up ad blocker.



▶ **Juggling downloads:** Another feature that's new to IE (but has been long enjoyed by users of other browsers) is its handy download manager.



▶ **XP extras:** An updated version of IE, sporting the download manager (above) and pop-up blocker, will ship in Windows XP Service Pack 2 in late 2004.

nexus mode, the nexus controls and protects the NCAs, which run in their own private memory spaces reserved by the nexus. The TPM keeps the private encryption key hidden from any software applications, with authentication performed by hardware and software in the background.

The processor, chipset, graphics and bus are all tied into the NGSCB, so data can be protected from the time it's entered into the keyboard, to when it travels through the system bus, CPU, memory, and video channel. At no stage can it be intercepted or interfered with by a rogue program.

And because programs run in discrete memory spaces, the information used by one program can't be accessed by another. This means that only the program which created the information can access it, leading to protection against theft or malicious software.

However, NGSCB is also the enabler for strict digital rights management, with the means to tie content to a PC instead of a particular person. So, does this mean that users will have to acquire multiple licenses if they want to store music files on both work and home computers? Only time will tell.

More information can be found in the NGSCB white paper that we've included on this month's cover CD, or at www.microsoft.com/resources/ngscb/default.mspx.

THE LONG AND THE SHORT OF IT

So, what's the verdict? We like what we've seen so far. On the whole, we expect developers and end users alike will embrace Longhorn, although issues such as digital rights management are already raising eyebrows. But the search capabilities, vector-based desktop and XAML functionality will dramatically change the way we use the PC.

That said, it's hard to get excited about a product that might not see daylight for three years. The drawn-out release schedule also has significant ramifications for existing users of Windows, as XP will be five years old by the time Longhorn lands. Even the Service Pack 2 and possible Service Pack 3 updates will only serve to keep XP limping along until Longhorn, by which time the successor to Windows XP could be hard to resist. **OUTLOOK**

The long haul

With drawn-out testing for Longhorn ahead, Matt Overington asks if Microsoft can maintain momentum.



Perhaps the biggest question at the dawn of the Longhorn test program is whether Microsoft has released too much information too soon. Never before has the public been so well-informed about an operating system that won't see the light of day for three years. So is the early launch of Longhorn merely Microsoft marketing hype? Or is it a shrewd push into the minds of developers?

The key driver for Longhorn's adoption will be a suite of applications that makes use of the new OS and its features. AMD hasn't been knocked over in the rush to pick up Athlon 64-based machines, largely because Microsoft won't be able to deliver a compatible 64-bit version of Windows until early 2004. There's no point in adopting a new technology — especially a platform technology like an operating system or hardware configuration — unless you have a significant need for it.

Microsoft is aware of this issue and is focusing hard on driving developer interest to ensure an entire ecosystem of applications exists by the time Longhorn hits the market. This pre-existing suite of applications leveraging the platform will help drive adoption of the OS, especially in the enterprise market.

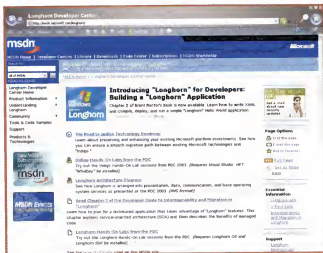
With that in mind, the company has committed to delivering two versions of Visual Studio (codenamed Whidbey and Orcas) before Longhorn hits the market to enable programmers to develop that ecosystem for the new OS.

Ever the marketing machine, Microsoft wants to capitalise on Longhorn by releasing a simultaneous wave of matching applications built specially for the platform. This is a smart move: most companies upgrade an OS and software suite at the same time, so releasing both together makes the upgrade seem more compelling for enterprise customers. It also allows for some competitive bundling deals, especially by OEMs wanting to push new "built for Longhorn" boxes out the door.

So, taking a leaf from Windows 95 and Windows 9x, Microsoft will launch a new edition of Office (currently referred to only as Office 12, but likely to be rebranded Office 2006) concurrently with Longhorn.

Not that Longhorn will need all-new apps — the OS is expected to be as compatible with non-Longhorn releases as Windows XP is with applications designed for Windows 9x and 2000. That doesn't mean that Longhorn can run all your existing software — many utilities may need upgrades, especially those which work closest to the foundations of the OS. But programs written expressly for Longhorn will certainly look better and work better when partnered with their native OS.

The problem this poses for Microsoft is how to maintain both customer interest and revenue between now and the time Longhorn makes it to market. Microsoft is fortunate to have a substantial chest of cash at the ready. Considering that Windows and Office are Microsoft's biggest earners, Redmond may have to dig deep to hold out for the next upgrade wave in 2006.



► **Meanwhile, back at the ranch:** Longhorn may be three years away but Microsoft has already created a public home page for the OS. The hype has begun...

The National

Think you've got some tech chops? Then you'd better take the definitive test for the IT geek crown.

Welcome to APC's second annual Geek IQ test. One hundred questions have been compiled by the APC team to twist your brain around 10 core tech categories. One question equals one point. The answers are at the end, with a bit extra for interest.

The supreme über-geek will win a \$6,500 multimedia machine from Optima and Intel, packed with software from Microsoft, Symantec and Adobe (more details on page 93).

Head to www.apcmag.com/geekiqtest, take the test online, and in 25 words or fewer, complete the following sentence: "The geekiest thing I did this year was..."

Accomplish this before Sunday January 4 and you could be kicking off the New Year with some fine new gear. All über-geeks in the top percentile will feature on apcmag.com. Adulation, envy and geeky groupies will surely follow.



History

- What year did Steve Ballmer become CEO of Microsoft?
☐ 1999 ☐ 2000 ☐ 2001 ☐ 2002
- When did digital camera sales overtake those of film cameras?
☐ 2001 ☐ 2002 ☐ 2003 ☐ 2004
- How do you soft-reset an Apple II computer?
☐ Open-Apple + Control + Delete
☐ Control + Reset
☐ Open-Apple + Control + Reset
☐ Reset
- What is the origin of the term "daemon"?
☐ An abbreviation for Disk and Executive MONITOR
☐ It was derived from the latin "demonstro", meaning "to indicate"
☐ It was inspired by Maxwell's daemon of physics and thermodynamics
☐ It is interchangeable with demon, a spectre that tirelessly performs chores in hell
- Which of the following was not one of the first household microcomputer brands during the late 1970s and early 1980s?
☐ Coleco ☐ DOT ☐ Tandy ☐ Alto
- Former US Vice-President Al Gore was widely criticised in technology circles for once saying he "took the initiative" in creating what?
☐ Linux
☐ The PC
☐ Windows
☐ The Internet



- Why was ENIAC created?
☐ To prove an electric calculator could be built
☐ To calculate bomb trajectories
☐ To create a machine that could resolve scientific problems
☐ To calculate government tax reports faster
- What did ENIAC stand for?
☐ Electronic Nuclear Interface and Controller
☐ Example Nine Interface Access Controller
☐ Electronic Numerical Integrator and Computer
☐ Electrically Normalised Interactive Automatic Calculator
- Which was the first 5V-only CPU?
☐ 8008 ☐ 8085 ☐ 8086 ☐ 8088
- Who led the team that designed the floppy?
☐ Alan Shugart
☐ David Nobel
☐ Doug Engelbart
☐ John Bardeen

Software

- How many platforms does OpenOffice.org 1.1 support?
☐ 2 ☐ 3 ☐ 4 ☐ 5
- Doom co-creator John Romero now creates software for which platform(s)?
☐ Macintosh
☐ x86
☐ Macintosh/x86
☐ Mobile/PDA
- What is Ogg Vorbis?
☐ Language translation tool
☐ Digital audio codec
☐ Text-to-speech converter
☐ File manager
- Which game release was recently delayed after the source code was stolen from the developer's network?
☐ Doom III
☐ Half-Life 2
☐ Duke Nukem Forever
☐ Halo 2
- What does VNC stand for?
☐ Very nice client
☐ Virtual network computing
☐ Viral network control
☐ Viable node communication



Geek IQ Test

1 What was the unreleased precursor to Mac OS X that ran on Intel x86 processors called?

- a Copland
- b Rhapsody
- c Chicago
- d WebObjects

2 Who invented the ZIP format, used for file compression?

- a Nico Mac
- b Phil Katz
- c Khaled Madam-Bey
- d Elias Howe

3 You can distribute a modified program under the GNU GPL license if you:

- a Show notice of the changes made and when they were made
- b Redistribute the changes at no cost to the original author
- c Advise end users of copyright and licence information in an appropriate manner
- d All of the above

4 Which was not a founding member of the Business Software Alliance?

- a Ashton-Tate
- b Lotus Development
- c Software Publishing Corp
- d WordStar

5 Which software application contains a Pokemon Pikachu Easter egg?

- a Adobe Photoshop 7
- b Microsoft Word 2000
- c Winamp 3
- d CodeWarrior Pro RS

Hardware

6 The official name of PCMCIA's new PCI Express-compatible PC card standard is:

- a NEWCARD
- b FastCard
- c PCMCIA Express
- d ExpressCard

7 DDRII RAM modules will feature how many pins?

- a 168
- b 184
- c 240
- d 256

8 What is the name of Intel's embedded processor for wireless gadgets such as handheld PCs, mobile phones and smartphones?

- a Centrino
- b Dothan
- c Pentium M
- d XScale

9 What fabrication process will be used to build Intel's new Prescott processor?

- a 0.13 micron
- b 0.65 micron
- c 0.90 micron
- d 0.32 micron

10 What was the size and capacity of the first commercialised floppy disks?

- a 9.5in, 16KB
- b 8in, 100KB
- c 11in, 64KB
- d 5.25in, 180KB

11 Why was the predecessor of the CGA graphics standard, the Hercules Graphics Card, so good?

- a It was high resolution
- b It offered twice as many colours as CGA
- c It was the first card to have 3D acceleration
- d It connected to both TVs and monitors

12 How many pins does the final-generation 64-bit Alpha processor have?

- a 1,443
- b 940
- c 587
- d 478

13 The Pentium OverDrive Processor for Socket 2 or Socket 3 boards could run at a maximum of:

- a 166MHz
- b 150MHz
- c 125MHz
- d 83MHz

14 What was the original FSB frequency proposed for the Springdale chipset?

- a 533MHz
- b 400MHz
- c 667MHz
- d 800MHz

15 What was the native capacity of the original Travan tape cartridge?

- a 1GB.
- b 200MB.
- c 800MB.
- d 400MB.

Networking

16 What is the length of an IPv6 address?

- a 256-bits
- b 128-bits
- c 64-bits
- d 32-bits

17 What does HSRP stand for?

- a Hot Standby Router Protocol
- b Hardware Standby Repair Pending
- c High Stability Routing Protocol
- d High Size Router Packets

18 The E1 digital transmission format specifies a channel bit rate of:

- a 44.736Mbits/s
- b 34.368Mbit/s
- c 2.048 Mbit/s
- d 1.54Mbit/s

19 How many wires are used in a Cat-5 cable for the common 100MB/s Fast Ethernet?

- a 8
- b 6
- c 4
- d 2

20 Which standard allows devices such as digital cameras and handheld PCs to connect at 800Mbit/s?

- a USB 2.0
- b 1934
- c IEEE 1394b
- d 802.11g



Networking

Which tool is used to hack the security encryption that protects 802.11 wireless traffic?

- ☐ A) Webspay
- ☐ B) AirSnort
- ☐ C) NetHack
- ☐ D) Ping

What is 100VG AnyLAN?

- ☐ A) A 100Mbit/s networking technology that supports Ethernet 802.3 and token ring 802.5 frames
- ☐ B) A 100Mbit/s networking technology that supported VoIP
- ☐ C) A 100Mbit/s networking technology that was totally incompatible with Ethernet and token ring topologies
- ☐ D) A 100Mbit/s networking technology invented by IBM

Which OSI layer is responsible for navigating the data through the network?

- ☐ A) Transport
- ☐ B) Session
- ☐ C) Network
- ☐ D) Client

What does the 802.11f standard define?

- ☐ A) A wireless networking standard that was never released
- ☐ B) GPRS mobile data
- ☐ C) Registration of access points in a wireless network
- ☐ D) Transmitter power requirements within Wi-Fi networks

What is the maximum speed of a token ring network?

- ☐ A) 16Mbit/s
- ☐ B) 100Mbit/s
- ☐ C) 1Gbit/s
- ☐ D) Gandalf wouldn't say

Programming

What do Python programmers mean by BDFL?

- ☐ A) Benevolent Dictator For Life.
- ☐ B) Boolean Differentiation Floating-point Limited.
- ☐ C) Better Dine Fast, Loser.
- ☐ D) Broken Download, Fix Later.



In his famous letter to *Datamation* magazine, "Real Programmers Don't Use Pascal", Ed Post claimed which of the following?

- ☐ A) Real programmers aren't afraid to use gosubs
- ☐ B) Real programmers do list processing in machine code
- ☐ C) Quiche-eaters use Pascal
- ☐ D) All of the above

Microsoft's .NET programming initiative is:

- ☐ A) Procedural
- ☐ B) Object-procedural
- ☐ C) Object-oriented
- ☐ D) None of the above

Who developed AppleSoft Basic?

- ☐ A) Apple
- ☐ B) Microsoft
- ☐ C) IBM
- ☐ D) Texas Instruments

Which of the following is the best place to find information about C#?

- ☐ A) MSDN
- ☐ B) Sourceforge
- ☐ C) Slashdot
- ☐ D) Freshmeat

The basic components of a Web service commonly include UDDI, WSDL, XML, HTTP and:

- ☐ A) PHP
- ☐ B) Active X
- ☐ C) DHCP
- ☐ D) SOAP

Niklaus Wirth invented the Pascal programming language in the US, but what nationality was he?

- ☐ A) Dutch
- ☐ B) French
- ☐ C) Swiss
- ☐ D) Canadian

From which column does COBOL source code program text commence?

- ☐ A) 1
- ☐ B) 20
- ☐ C) 8
- ☐ D) 12

The TSR program:

- ☐ A) Provides technical support feedback data over the Internet
- ☐ B) Helps you improve your Dungeons and Dragons skills
- ☐ C) Allows DOS programs to use more than 640KB of memory
- ☐ D) Stays in memory after quitting

What was the first object-oriented programming language?

- ☐ A) Simula 1
- ☐ B) Fortran
- ☐ C) ADA
- ☐ D) COBOL

Internet

What is a CMUX?

- ☐ A) Customer Multiplexer
- ☐ B) Client Multiplexer
- ☐ C) Client Multiplexer Under Exchange
- ☐ D) Client Metropolitan Upgrade Exchange

ICQ is to instant messaging as Skype is to:

- ☐ A) Voice over IP (VoIP)
- ☐ B) Internet Relay Chat (IRC)
- ☐ C) Online gaming
- ☐ D) File-swapping

Vint Cerf is credited with designing what?

- ☐ A) World Wide Web
- ☐ B) Domain Name System
- ☐ C) URL
- ☐ D) TCP/IP protocol

In addition to .com, .net and .org, which of the following groups feature ALL top-level international Internet domains?

- ☐ A) .museum, .biz, .kids
- ☐ B) .museum, .info, .kids
- ☐ C) .aero, .name, .biz
- ☐ D) .coop, .pro, .porn

What was the purpose of FidoNet?

- ☐ A) Allowed you to telnet into BBSs
- ☐ B) Exchanged mail between BBSs and the Internet
- ☐ C) Email network created especially for dog breeders
- ☐ D) Allowed connections from one BBS to another without redialling



6. What is DoV?

- A white bird that symbolises peace
- The next generation of video disc
- An ISDN connection standard
- Voice and data over optical fibre

7. What does an SMTP Reply code of 550 refer to?

- The supplied command had a syntax error
- The requested mailbox is unavailable
- The requested mailbox is not local and the message will be relayed
- The requested mailbox is not local, but the message will not be relayed

8. On 22 October 2002, a large denial of service attack was launched on the 13 root DNS servers. How many of these servers were disabled during the attack?

- 4
- 7
- 9
- 13

9. In what year was USENET established?

- 1969
- 1971
- 1980
- 1979

10. Where was GOPHER invented?

- University of Minnesota
- Oxford
- IBM Thomas Watson Laboratories
- US Department of Defense Laboratories

Security

11. What port should be left open for ICMP pings?

- 22
- 8
- 0
- None

12. Researchers in which country recently broke GSM mobile encryption?

- Australia
- Russia
- Israel
- Britain

13. What worm did Telstra initially claim was responsible for its October email meltdown?

- Swen
- SoBig
- Klez
- Blaster

14. Version 1.4 of the CIH or Chernobyl virus differs from version 1.3 in what way?

- It launches itself every month, as opposed to every year
- It deletes the Windows directory only
- It deletes files on Linux systems
- Once infected, the hard drive is permanently damaged

15. Microsoft was embarrassed by a security incident in 2000 in which hackers potentially had access to confidential product blueprints. What was the name of the Trojan horse virus that caused the incident?

- Melissa
- QAZ
- MSBLAST
- ILOVEYOU



16. Microsoft announced the RPC security vulnerability in 2003, widely regarded as one of the most widespread flaws ever discovered in Windows. What does RPC stand for?

- Remote Protocol Call
- Relay Port Check
- Remote Procedure Call
- Really Persistent Cracker

Windows

17. How long did it take after Windows Server 2003's April 24 launch for the OS to require patching?

- 11 minutes
- 11 hours
- 11 days
- 11 weeks

18. Which of the following is not a Windows codename?

- Harmony
- Talisker
- Coyote
- Yukon

19. What is the codename of the new GUI being developed for Microsoft's next version of Windows, called Longhorn?

- Ergo
- Aero
- Asis
- Avalon

20. What feature caused an outcry about privacy concerns when first introduced in a test version of Windows XP?

- Smart Tags
- Bluetooth
- OneNote
- Passport

21. In what year did Microsoft withdraw its At Work fax technology?

- 1995
- 1996
- 1997
- 1998

22. What kind of characters can you use in a WEP key?

- Numeric
- Hexadecimal
- Alphanumeric
- Unicode

23. Which one of the following is not a symmetric encryption algorithm?

- IDEA
- DES
- Blowfish
- RSA

24. How many keys in the total key-length in Triple DES encryption?

- 192
- 256
- 3 x 16-bit
- 3 x 64-bit

25. How long did it take for code that exploits two buffer overruns in the Remote Procedure Call interface in Windows, reported in July 2003, to appear in the wild?

- One day
- Two days
- Four days
- Eight days

26. What is the purpose of the SysRq key in Windows?

- Nothing at all
- Nobody knows
- Schedules an NT Kernel restart
- Prevents scrolling in some programs (for example, Excel)

27. Which one of these Windows XP features is included in the Home edition of the Operating System?

- Support for Encrypting File Systems (EFS)
- Support for joining a computer to a Windows Domain
- Remote Desktop
- Windows File Protection

28. What was the name of the executable file used to launch Windows 3.x?

- win.com
- win.exe
- windows.com
- windows.exe

29. What was the name of the file manager Microsoft provided in Windows versions before version 3.0?

- File Manager
- Windows Manager
- MS-DOS Executive
- Sysedit

30. What non-Microsoft program shipped with Windows 3.0?

- Asymetrix ToolBook
- Lotus Organizer
- Harvard Graphics
- Borland Sidekick

Alternative OS

1 What message appeared when an Amiga had a system-wide crash?

- ☐ The error 'o death
- ☐ System stuffed
- ☐ Commodore 64 BIOS failure
- ☐ Guru meditation

2 What was the most popular operating system for Automatic Teller Machines before Windows and Linux?

- ☐ UNIX
- ☐ BeOS
- ☐ OS/2
- ☐ DOS

3 Who developed Xenix, a version of Unix compatible with AT&T's System V definition?

- ☐ Xerox
- ☐ Digital Equipment Corporation
- ☐ Tandy
- ☐ Microsoft

4 What is the collective noun for a group of penguins?

- ☐ Waddle
- ☐ Herd
- ☐ Flock
- ☐ Kernel



5 Which of the following is not classified as a window manager for Linux?

- ☐ X-Windows
- ☐ Gnome
- ☐ KDE
- ☐ Enlightenment

6 What logo represents the Gnome desktop environment for Linux?

- ☐ Horse
- ☐ Penguin
- ☐ Hand
- ☐ Foot

7 What is the CP/M operating system command for a directory listing?

- ☐ list
- ☐ dir
- ☐ show
- ☐ files

8 Pick the odd one out:

- ☐ ext2fs
- ☐ ext3
- ☐ XFS
- ☐ ReiserFS

9 How is BeOS 5 Personal Edition crippled?

- ☐ It doesn't include royalty-bearing features
- ☐ It reboots after 30 minutes of operation
- ☐ It doesn't include networking support
- ☐ It doesn't feature audio drivers

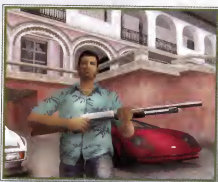
10 Which of the following is not a Linux distribution?

- ☐ GeeXboX
- ☐ L.A.S.
- ☐ Ferar
- ☐ MEPIS

Geek Culture

1 Who voice-acted Tommy Vercetti in Grand Theft Auto: Vice City?

- ☐ James Gandolfini
- ☐ Joe Pantoliano
- ☐ Ray Liotta
- ☐ Al Pacino



2 What did Dennis Fong win at Red Annihilation?

- ☐ A Pentium II PC
- ☐ A '97 Ferrari 328GTS
- ☐ US\$10,000
- ☐ A vintage '82 Dodge Viper

3 Who has the nickname "Monkeyboy"?

- ☐ Bill Gates
- ☐ Larry Ellison
- ☐ Steve Ballmer
- ☐ Keanu Reeves

4 What film-making technique relies on video game software instead of cameras?

- ☐ Anime
- ☐ Machinima
- ☐ CGI
- ☐ Motion capture

5 In the novel Cuckoo's Egg, what was the codename of the hacker tracked by Cliff Stoll?

- ☐ Hunter
- ☐ Mitnick
- ☐ Cereal Killer
- ☐ Cap'n Crunch

6 What is the visor belonging to Geordi in Star Trek: The Next Generation made from?

- ☐ A car air filter
- ☐ Custom-made Bollé frames
- ☐ A party jumping jack
- ☐ A model train bridge

7 What is the RFC reference for HTCP, protocol for controlling, monitoring and diagnosing coffee pots?

- ☐ RFC 1492
- ☐ RFC 2324
- ☐ RFC 2497

8 HTCP does not exist, and there is no such RFC

9 Who is the host at Milliwatts?

- ☐ Slartibartfast
- ☐ Max Quordlepleen
- ☐ Dr Dan Streetmentioner
- ☐ Ronald McDonald

10 How much power did Doc Brown's Delorean time machine need to generate to enable time travel in Back To The Future?

- ☐ 12 megawatts
- ☐ 1.21 gigawatts
- ☐ 88,000 megawatts
- ☐ 52.5 gigawatts

11 Who wrote Elite?

- ☐ Sid Meier
- ☐ David Braben
- ☐ Geoff Crammond
- ☐ Richard Garriott

Answers

History

Bill Gates' first business management hire back in 1980 has proved a stayer.

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The writing is on the wall for the film camera, and with digital snappers embedded into the growing number of mobile phones, the gulf is only going to widen. Even film's last bastion, single lens reflex cameras, are under siege: digital SLRs came down to a reasonable price in 2003. Professionals no longer look on digital cameras as toys, and most have at least one.

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It was inspired by Maxwell's daemon of physics and thermodynamics

It is generally defined as a program that runs continuously in the background until activated by a particular event. A daemon can constantly query for requests or await direct action from a user or other process. The term is believed to have originated in a 1962 memo, when British MIT programmer Michael Bailey was trying to name what are today known as "system processes". The word and its curious spelling — of Greek descent — first formally appeared in CTSS and Multics documentation.

Developed in 1973 by researchers in Xerox's futuristic Palo Alto labs, the Alto was more a curiosity piece than an everyday home PC. Apple's Steve Jobs saw one at the facility and was struck by its advanced features, including the first graphical interface and icons, and a pointing device called a mouse. Jobs immediately ordered that a GUI be built for Apple machines.

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Gore has a history of diving into geek matters where other politicians

might fear to tread. He is most famous for his Internet claim, met by a wave of scorn from Net diehards. But Gore's association with technology goes far beyond that unfortunate episode.

A noted Mac fan, he sits on the Apple board of directors and has been a senior advisor to Google. Even his ill-fated presidential campaign was claimed to be open source, setting up a Gore 2000 Volunteer Source Code Project.

To calculate bomb trajectories

ENIAC was created by University of Pennsylvania boffins in 1943, paid for by US Army Ordnance funds to provide a more accurate way of calculating bomb trajectories in World War II.

Electronic Numerical Integrator and Computer

8085

Launched in March 1976, the 8085 5MHz, 3-micron processor with 6,500 transistors took centre stage. It was the fourth processor Intel released and operated for the first time on a single 5-volt power supply (down from 12v).

Alan Shugart

Shugart led the IBM engineers in the development of the first floppy, an 8in plastic-coated disk introduced in 1971. He left IBM to work at Memorex, before founding Shugart Technology in 1979. The company later changed its name to Seagate Technology.

Alan Shugart



Alto



Software

If you're a Linux, Solaris, Windows or MacOS X user, there's a flavour of OpenOffice for you. The three-year-old office suite has steadily gathered a following attracted as a consequence of its stability and its similarity to Microsoft Office. Oh, and the fact that it's free.

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Mobile/PDA

Clashing personalities and ideas between the passionate "design is law" — Romero and the programmer's programmer John Carmack saw Romero exit id Software, creator of Doom and Quake. Romero started his own games company, Ion Storm, sparing no expense in attracting top talent to new, opulent headquarters in the penthouse suite of a Dallas high-rise.

What followed was a series of embarrassing flops as the resulting games consistently failed to match management's grandiose promises. A chastened Romero departed the PC games industry, finding his niche in the mobile field. His new company, Monkeystone Games (www.monkeystone.com), has a significantly lower profile and is more successful, to boot.

Digital audio codec

It's probably the oddest-sounding technology you've heard of in a while, but Ogg Vorbis has gained something of a cult following among the digital audio-obsessed. Unlike the MP3 and WMA audio formats, Ogg is an open source decoder, meaning it's popular among Linux users. Software and hardware companies can create music players that use Ogg as their underlying decoding technology without paying royalty fees. It's hard to see how Ogg could ever become a household name, though, given the huge popularity of MP3. "Dude, where's my Ogg?" just doesn't have the same ring to it.

Half-Life 2

Gamers are renowned for trying anything to get their hands on new titles, but the record for effort was broken last year when someone managed to copy the entire source code for the under-development Half-Life 2. Reports say the hackers had been secretly monitoring the keystrokes of the game's developers at Valve Software and had access to confidential email accounts. The leak meant the



Software

blockbuster game missed the crucial holiday shopping period. It left many wondering what the code was doing on a net-connected system in the first place.

Virtual network computing

Stuck half-way across the world and want to show a work colleague exactly what's on your PC? VNC is a platform-independent remote control program that allows people to share the same computer screen over local networks or the Internet, regardless of which operating system the client and server is running. The free program was developed by research staff at AT&T.

Rhapsody

Rhapsody was a development project that arose out of Apple's acquisition of NeXT software (a technology company Steve Jobs formed after leaving Apple in the early 1990s). It combined NeXT's OpenStep operating system with elements of the Mac interface. However, getting Mac software moved over to the platform-independent Rhapsody OS wasn't easy, and the software industry was hesitant to jump on board. Instead, Rhapsody was developed into Mac OS X.

Phil Katz

Anyone who has downloaded a file with the ZIP suffix has used the compressed format developed by Phillip W. Katz. His program PKZip was just a hobby he launched from his mother's kitchen table in 1986. Katz died alone in a Milwaukee motel room in April 2000 of complications from chronic alcoholism. He was 37.

All of the above

WordStar

CodeWarrior Pro RS

Go to www.eeggs.com/items/14267.html if you want instructions to unwrap it. You get an ASCII image of Pikachu, and all the addresses in the listing will be replaced by variations on "pika-pika".

Hardware

ExpressCard

While NEWCARD was the working title, ExpressCard is the official name. PCMCIA, the USB Implementers Forum (USB IF) and the Peripherals Component Interconnect Special Interest Group (PCI-SIG) have all worked towards development and compliance for ExpressCard. Key vendor-supporters include Dell, Microsoft, HP, IBM and Sun. Device testing is scheduled for early 2004.

240

While DDRII RAM is already seeping into high-end video cards, you can't go to your local parts store and buy a couple of sticks — yet. Vendors hope design incompatibilities can be eliminated to clear the way for a 2004 launch. With speeds expected to go up to 667MHz courtesy of a 0.10 micron process, so do performance enthusiasts.

XScale

Intel's XScale processor is found in handheld devices such as Microsoft Pocket PCs and some Sony CLIE units, as well as new smartphones featuring video players and built-in cameras. The chip runs at a maximum of 400MHz, and a faster version called Bulverde is being readied with improved battery consumption and integrated video camera functions.

0.90 micron

Not only are computer chips getting faster, they're getting smaller. Transistors in Intel's Prescott Pentium processor, due this year, will be less than a thousandth the width of a human hair. The smaller the transistors, the more that can be squeezed onto a CPU and the better the performance. Chips made with .90 nanometer processes use parts smaller than the influenza virus. Intel has plans to start .65nm production in 2005, and .45nm in 2007.

8in, 100KB

They were introduced for use in mainframes in the early 1970s.

It was high resolution

Although it offered only black and white graphics (black and green or black and amber in practice), the Hercules Graphics Card had an amazingly high resolution for its day. Its 720 x 348-pixel graphics were superior to its

successor, CGA, with 640 x 200-pixel graphics in two colours or 320 x 200 in four.

1,443

Despite being first announced in July 2001, the original DEC EV7 didn't debut until January 2002 when the Compaq AlphaServer G5 Series shipped with the with the 1GHz, 64-bit Alpha processor.

83MHz

The 237-pin, 5V processor could run at a maximum of 83 and 63MHz, respectively.

667MHz

The Intel 865 eventually came out with six versions in total. The 875P and the 865PE chipsets support dual DDR 400 and FSB 800 for the Pentium 4. Other FSB 800 versions of Springdale include the 865G with integrated graphics and the 865PE without graphics. There is also the 865P without graphics and FSB 400/533. All three versions can cope with an integrated Serial ATA RAID controller in the ICH5 Southbridge.

400MB

The Imation Travan TR1 400MB cartridge was originally released in the mid-1990s. While you can still get the 400MB version for about US\$25, you can also get it up to 20GB.

Networking

128-bits

With the long-standing Internet protocol v4 requiring a revision, IPv6 has freed up addressing space for the flood of networked devices, as well as the exploding online space. The new protocol features auto-configuration of network addressing and host-to-host encryption, which will presumably offer superior privacy.

Hot Standby Router Protocol

HSRP ensures increased network uptime and minimal topology disruption. A lead router in the HSRP group is designated to handle packets sent to a given address — the "hot standby" address. The other routers track the lead router, and in the event of it failing, one commences handling the hot standby address and lead role.

2.048Mbit/s

If you're on IRC and some script kiddie in the United States says he has a T-1 connection, he



Phil Katz

quite possibly has a Primary Rate Interface (PRI) ISDN connection running at 1.544Mbit/s to his location. Translation? Think of the equivalent of a big bundle of phone lines. In Australia the standard for these primary ISDN connections is called E1, which equates to 30 phone lines at 64Kbit/s each. If you quote your Net bill was big, wait until you try this.

2 4

While Cat-5 cables contain a total of eight wires, 100BASE-TX Fast Ethernet calls for signalling over only two pairs. The fact that only four of the eight wires are in use has led to the development of Power over Ethernet (PoE) devices. Another pair of wires in the cable is used for the transmission of power down the Ethernet cable, typically to devices such as wireless access points, allowing them to be located up to 100m from a power point.

2 IEEE 1394b

Also known as FireWire, the 1394b standard is found in notebook computers and digital video and photo cameras. FireWire also has a built-in power supply that can be used to recharge power devices.

2 AirSnort

It's possible to discover the encryption key used to protect communications over wireless 802.11b networks. Using AirSnort and a wireless-equipped notebook, you can "sniff" the air for wireless data packets, and when enough have been collected, the key can be calculated. It's not easy though. The people who make AirSnort estimate you need 5-10 million packets, which could take many, many hours of eavesdropping.

2 A 100Mbit/s networking technology that supports Ethernet 802.3 and Token Ring 802.5 frames

A curiosity piece in the history of networking, the AnyLAN standard tried to provide compatibility for the competing Ethernet and Token Ring technologies. They had different methods of achieving the same aim, providing a way for networks to carry traffic from many PCs without data colliding or failing to reach its destination. Ethernet eventually won out, although there are still rare instances of Token Ring in use.

2 Network

Every time an email sent or a request is made over the Internet, the message goes through

stages called the OSI layer. There are seven layers, each handling a different aspect of the journey from the browser window all the way to the nitty-gritty of what goes on inside the undersea cable. The network layer handles the routing of individual packets. For extreme geekiness, stun your friends by reciting the seven layers: application, presentation, session, transport, network, data-link and physical.

2 Registration of access points in a wireless network

Although there are better-known 802.11 standards that relate to entire wireless networking protocols, there are many you've probably never heard of. The 802.11f standard defines how wireless access points should register their presence within a wireless network.



2 1Gbit/s

Despite the overwhelming dominance of Ethernet as a networking standard, the 802.5 Token Ring standard has been continually upgraded all the way to 1Gbit/s speeds.

Programming

2 Benevolent Dictator For Life

The term is occasionally used to describe the author and lead developer of the Python programming language, Guido van Rossum. He doesn't micro-manage every aspect of the OS, but has executive control. His personal Web page is at www.python.org/~guido.

2 Quiche eaters use Pascal

Post's wry observations of what constitutes a "real" programmer quickly became the stuff of geek legend. Post took potshots at everyone from "high-school students with Trash-80s" to "Fortran preprocessors like Mortran and Ratfor. The Cuisinarts of programming — great for making Quiche." Post asserted that real programmers used Fortran and eschewed the vices of structured programming. He also grudgingly admitted that "even Unix might not be as bad as Real Programmers as it once was".

2 Object-oriented

Object-oriented programming concentrates on objects rather than the logic needed to get programs to work. Object-oriented languages C#, Java, Smalltalk and others treat pieces of code as reusable and interchangeable objects that can be swapped between programs.

2 Microsoft

True geeks might already know that Apple founder and inventor Steve Wozniak wrote the first version of Basic for an Apple all by himself — it was called Integer Basic. But most probably don't realise that Apple turned to Microsoft when it needed a new version of Basic for the Apple II Plus. Bill Gates had a reputation for Microsoft's version of Basic for the Altair computer.

2 MSDN

While you might find information about C# on Sourceforge, Slashdot or Freshmeat, it's unlikely to be complimentary. The three sites are hangouts for Linux and open source programmers, and C# is a Microsoft-created programming language designed to work with the .NET software platform and combining C++ with elements of Visual Basic.

2 SOAP

SOAP is a way for programs written for Windows to communicate with other programs, including those written for other OSes such as Linux. Combined with other components, these allow software to communicate with non-compatible systems over the Internet.

2 Swiss

Niklaus was born in Winterthur, Switzerland, in 1934. In 1963, he earned a PhD from the University of California Berkeley. In 1968 he took a two-year sabbatical at Xerox's famed research labs in California. Pascal, created in 1970, is significant because generations of students learnt to program with it and it was used in the first Macintosh OS. (Blaise Pascal was a 17th-century mathematician and philosopher credited with designing the first mechanical calculator.)

2 B

They don't make programming languages like they used to. According to legend, COBOL was developed in six months, and it is still in use more than 40 years later. The language found its way into many financial applications, and while some argued that COBOL programmers





were a dying breed, experts were in big demand in the pre-Y2K period.

⑤ Stays in memory after quitting

Terminate Stay Resident (TSR) programs were primitive yet ingenious ways of adding multitasking capabilities to DOS, which could normally run only one program at a time. A TSR program would stay in memory after quitting, leaving an instruction for DOS not to use that memory. It was triggered by a hardware interrupt, such as a specific set of keys recognized directly by the computer's BIOS.

⑥ Simula 1

Simula 1, created in 1962, was the first programming language to introduce object-oriented concepts such as objects and classes.

Internet

① Customer Multiplexer

A CMUX is the terminating point for users' ADSL traffic. For ADSL to work, you need a copper connection to one. If you're one of the many users who can't yet access ADSL services, it's because Telstra has one of its much maligned fibre-optic RIMs connecting your phone to the exchange. The telco has been installing CMUXes in RIMs as a way of enabling some users to gain ADSL access.

② Voice over IP (VoIP)

When the creators of Kazaa decided to make an Internet telephony client, they went all out. Skype (www.skype.com) is P2P telephony. It circumvents certain firewalls and auto configures in most cases. Telcos don't know what to make of it yet. Perhaps if the technology takes off and Skype make money from their paid model, the telcos might awaken in the same way the music industry did to file sharing — with litigation.

③ TCP/IP protocol

Before there were browsers or graphics or even the World Wide Web, the Internet still allowed remote computers to network and transfer data. The key was TCP/IP, a protocol that allowed different systems and networks to communicate in the same language. Files are split into smaller chunks and sent via TCP, and the IP address is used to find the correct network destination.

④ .aero, .name, .biz

All sorts of weird and wacky domains have been suggested over the years, but so far only

seven new names were listed by ICANN in November 2000 to supplement .com, .net and .org. Despite much lobbying there has never been an adult-safe domain or specific sex related domain introduced. Some suggestions have included .kids for non-porn Web sites, as well as .xxx and .sex.

⑤ Exchanged mail between BBSs and the Internet

FidoNet's primary purpose was to pass mail out of BBSs and onto the Internet, before internet connections were commonplace. At its peak, about 10,000 BBSs were arranged in a highly organised mesh, dialling each other and passing mail down the line, where it would eventually be dumped onto the internet via a UUCP gateway. Some people still argue FidoNet is necessary as a backup to internet meltdowns.

⑥ An ISDN connection standard

DoV stands for Data over Voice, and uses the voice channel of an ISDN connection to transmit data. Its main reason for existence in Australia was to take advantage of the untimed voice calls Telstra offered on its residential ISDN service.

⑦ The requested mailbox is unavailable

⑧ 9

The 13 DNS root servers are the backbone that runs the domain names and IP addresses on the Web. The DDoS attack of unknown origin interrupted Web traffic on nine of the 13 DNS root servers for one hour. The one hour attack was performed via ICMP requests (ping-flooding) to the root servers. Only four of 13 root servers remained up and running while seven were completely crippled.

⑨ 197

A meeting between the University of Wisconsin, DARPA, National Science Foundation (NSF) and computer scientists from many universities established a Computer Science Department research computer network (organised by Larry Landweber). The CSD established USENET using UUCP between Duke University and the University of North Carolina. All original groups were under net.* hierarchy.

⑩ University of Minnesota

Developed in 1991, GOPHER is a hierarchically-based text menu system which allows users to navigate a site's information bank, plus connect to other information sites. The name is derived from the Uni's football team, the Golden Gophers.

Security

① None

ICMP pings don't go through TCP or UDP, two connection protocols that use the port system. ICMP pings actually use the bare IP layer. However there are "types" of ICMP pings - type 8 is an echo-request (ping) and type-0 is an echo reply (pong). The official ICANN document describing how ICMP works (RFC792) makes great bedtime reading — get through that and you're well on way to geekdom.

② Israel

Researchers in Israel broke the encryption for the GSM phone system by masquerading on a GSM mobile network as a base station, and then taking advantage of a fundamental mistake in the GSM protocol, which transmits unencrypted information while a call is being set-up.

③ Swen



The cost of the virus has been estimated by at \$25 million but may go much higher if a threatened class action goes ahead.

④ It launches itself every month as opposed to every year

Patches guarding against the destructive CIH virus are now easy to find on the Web (the virus is years old), so programmers upped the ante. Version 1.4 triggers the attacks on the 26th of every month, not just the 26th of April — the anniversary of the Chernobyl disaster. Random information is written to the hard drive constantly until the system crashes. Because the virus starts at sector 0, rebooting is impossible. Then CIH attempts to corrupt the Flash BIOS.

⑤ QAZ

A red-faced Microsoft CEO Steve Ballmer admitted the company's internal network



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was broken into in 2000. The culprits' weapon was said to be QAZ, a Trojan horse virus that is delivered as an email attachment and reports its progress back to the hacker. Officials admitted it was anywhere from four to five weeks before someone blew the whistle, but stressed that Windows source code hadn't been tampered with. Still, Microsoft's already battered reputation for data security was left in tatters.

4 Remote Procedure Call

The RPC flaw was like a beacon to bored virus writers looking to play havoc on the Internet. Officially announced by Microsoft in July 2003, the problem involved the system that allows remote users to share files and printers. By exploiting the loophole, attackers were able to gain full access to Windows machines, with the ability to reformat drives, add new user accounts and change Web pages. The result was the spread of the MSBLAST Internet worm, which hackers used to install attack bots on infected machines.

5 Hexadecimal.

WEP stands for Wired Equivalent Privacy, and is the universal encryption method for protecting communications over 802.11 wireless networks. Because wireless networks aren't bound by physical cables, extra levels of security are needed other than just passwords. Users of wireless-equipped notebooks should ensure that they are using some other security levels in addition to WEP — with the right tools, it's possible for someone to eavesdrop on WEP-protected data traffic.

6 RSA.

For a long time RSA was the most important standard in the cloak-and-dagger world of secret encryption formulas. Developed in the 1970s, RSA became the most common encryption algorithm used in programs like Netscape and Internet Explorer, Lotus Notes and Intuit's Quicken. Unlike other encryption algorithms, the RSA system doesn't rely on someone sending you a copy of their private key to unlock encrypted data sent to you. RSA relies on the calculation of very large prime numbers for securing data, but in recent times other new forms of encryption have become popular and are seen as more secure.

7 3 x 16-bit

All those hacking films like *Swordfish* and *Sneakers* might be a little unrealistic, but when

it comes to hacking secret encrypted data traffic there's a grain of truth. Back in the mid-1970s when encryption algorithms were first being developed, the idea of secret encryption routines being easily hacked was unthinkable. The only people capable of cracking the single 64-bit key lengths used for DES encryption at the time were government spies. But as computer power increased in the 1990s, those unbreakable codes proved to be woefully inadequate. Competitions with cash prizes were even run to see who could break the code first.

8 Two days

Security researchers are a strange bunch. In an effort to create awareness about holes in Windows, some groups rush to post code that exploits those security flaws. In this case, a group calling itself Xforce posted exploit code online just two days after a Windows' flaw was revealed. Their motto? "From the Internet. For the Internet. Have fun!" Most people usually have a few days to patch their systems after news about a new Windows hole, but that prep-time is rapidly disappearing with activity like this.

Windows

9 11 weeks

Hailed by its makers as the most secure Windows server OS yet, Windows Server 2003 quickly reached the end of its honeymoon period. On the July 9 a new version of the familiar buffer overrun exploit surfaced, signalling the beginning of a horror run for Microsoft in the security stakes. The Blaster and Sobig worms wreaked havoc on both PCs and Microsoft's security reputation.

10 Coyote

Whoever dreams up the wacky codenames for Microsoft products certainly has their hands full, and an active imagination. Harmony is the codename for Windows Media Center 2004, while Talisker is a Windows CE platform creation and Yukon is the sequel to SQL server.

11 Aero

The new graphical interface will incorporate 3D effects into Windows, including transparent desktop elements and windows that flutter as if caught in a breeze when dragged across the screen. Of course, you'll need a 3D video card.

12 Passport

It seemed like a good idea at the time, providing Internet users with a single Web location for

signing onto different accounts. But Passport didn't seem so cool when Microsoft revealed the full scope of its plan: to turn the service into an über-vault for consumers' shopping, banking, passwords and personal details. No-one seemed to agree with Microsoft that the software giant would be the safest custodian of our credit card numbers, and that aspect of Passport went back to the drawing board.

13 1995

In 1995 Microsoft withdrew its Microsoft At-Work logo program, after users gave it the cold shoulder for being over-complicated. The idea was for faxes and printers to use an embedded Microsoft system to send data in digital form, rather than scanned images. Very few manufacturers warmed to the idea of paying Microsoft royalties for every fax, copier and printer they shipped.

14 Nothing at all

The SysRq key has always been ignored by both DOS and Windows. However, it did have a special purpose originally — triggering a BIOS interrupt (15H), rather than putting something into the computer's keyboard buffer. If an operating system traps that interrupt, the SysRq key can be used even when the computer isn't accepting other keyboard commands, due to a program crash, for example. Some flavours of Linux use it for special functions like killing processes or switching off the computer.

15 Windows File Protection

This little feature was first introduced in Windows 2000 to monitor crucial files. It runs in the background and when a change is applied to any file that is considered "protected," WFP will restore the file to the right version. While it helped newbie users who didn't know enough to know when they were deleting system files during their annual spring clean of the hard drive, it peeved savvy users. Not only was File Protection deemed a waste of resources, it was also a general nuisance when trying to fiddle in the systemroot directories, or when trying to avoid copious reboots when rolling out lots of patches to remote systems. Many smart users began disabling WFP.

16 win.com

Ahhh, the bad old days, when programs came on floppy disks and you had to manually load Windows. Before Windows 95, the magic text to start Windows was win.com, which

Software Failure. Press left mouse button to continue.
Guru Meditation #00000004.0000AAC0

would also determine if standard mode or 386-enhanced mode should be used.

MS-DOS Executive

It was 1985. Apple stole the interface from Xerox. Microsoft stole it from Apple. Apple cried foul and tried to sue. In court someone sneezed "Hypocritelers!" — actually, it was just us here in the APC bunker. MS-DOS Executive began life as the central launching program for Windows 1.01. It allowed users to click a drive or directory to navigate DOS in a graphical environment.

Asymetrix ToolBook

It just rolls off the tongue, don't it? What started as a badly-named multimedia development tool, which eschewed a flowchart model for a page model using scripted objects, has continued to evolve even today. Except today it's used to create military simulations among other SCORM and AICC-compliant content.

Alternative OS

Guru meditation

The origins of the odd "Guru meditation" error screen on Amiga apparently originated from the lead programmer of the Amiga operating system, who would try to relax each time a prototype of the operating system crashed by sitting cross-legged on an Atari Joyboard.

OS/2

OS/2 may not have been a hit with consumers, but it was the operating system of choice for ATM manufacturers due to its security and support. However, since IBM started moving toward discontinuing OS/2 in the late '90s, Microsoft has been marketing a specific version of Windows suited to ATMs called Windows embedded. Let's hope this isn't as susceptible to viruses as other versions of Windows.

Microsoft

A little known fact is that Microsoft had another popular operating system before the release of MS-DOS with the IBM PC, this one based on UNIX. Called Xenix, supposedly because Microsoft couldn't license the Unix name, the software was released in 1980 for 16-bit micro PCs. Xenix made its way onto computers from Altos and Tandy, but its main success came from Intel's x86 processors.

Waddle

Penguin worship has become almost a cult since the emergence of Linux's Tux mascot.

You can find all sorts of associated geek souvenirs, including penguin stickers, fluffy toys, screensavers, logos and even (shudder) jewellery. If you're dropping this bit of useless trivia about the word "waddle" at a geek gathering, you can say it came from the 4th International Penguin conference in Chile in September 2000. The good people at the conference also helpfully coined the term "raft" to describe a group of penguins floating on the surface. We kid you not.

X-Windows

It's somewhat ironic that the interface fundamental to most Linux systems is called X-Windows. Unlike Microsoft's Windows, this version sits underneath the desktop, and the "look and feel" is provided by add-on window managers such as Gnome or KDE. Linux users are fiercely loyal to their choice of desktop environment. Just like Mac and Windows users, really.

foot

Yes, it's possibly the weirdest product logo we've seen in a while, but for some reason the Gnome people feel their software is best summed up by a foot. One explanation on a Gnome Web site claims there's no specific reason for the foot — it just looks good. If anyone has any other theories about the foot, we'd love to hear them.

dir

Created by computer science teacher Gary Kildall in 1972, CP/M was highly regarded by early computer users and almost scored a pivotal place in the evolution of the PC. IBM considered CP/M for its first PC before turning to Bill Gates, who bought another OS and renamed it MS-DOS. Despite being eclipsed by Microsoft's software, CP/M could still be found in limited use in the late 1980s.

ext2fs

All the entries listed are filesystems able to be used with Linux, but ext3, XFS and ReiserFS are journalling filesystems. Such variants cue disk writing tasks to a special part of the disk — a journal — before being written to their "proper" place. In the event of a system crash, such techniques help minimise the chance of data corruption.



It doesn't include royalty-bearing features

Life's tough when you're just a little OS trying to change the world. Like many other Microsoft rivals, BeOS couldn't afford to pay royalty fees for add-in product features in its free Personal Edition, so it left them out. Missing was a built-in MP3 codec, the Indeo 5 video encoder and RealPlayer G2 support. It's a similar story with the free version of Red Hat Linux, which doesn't include a built-in MP3 codec.

Feraro

Linux distros have a history of weird and wonderful sounding names, like Slackware, GeeXboX and the cheeky Lindows. So far no-one's created a Linux distro named Feraro, though we wouldn't rule it out

Geek Culture

Ray Liotta

The one-time Goodfella lent his vocals to Rockstar Games' masterful tale of Floridian mob intrigue. And while the pastel settings of '80s Miami might lull the unaware into thinking GTA:VC might be prone to whimsy, Liotta's tough-as-nails performance quickly corrects that misconception.



A '97 Ferrari 328 GTS

Fong, using his playing nickname "Thresh", won the first big-time Quake competition back in 1997. After elimination rounds online, finalists played at the E3 entertainment expo to decide who would drive off with the Ferrari, donated by id Software's John Carmack. Fong went on to dominate the competitive Quake world, and became the first "pro-gamer" — making a living off computer games. Fong currently runs Gamers.com.

Steve Ballmer

In one fell swoop Microsoft's CEO managed to transform his image from a take-no-prisoners software visionary into a dancing, screeching corporate buffoon during a conference presentation in 2001. Exactly what possessed him we may never know, but Ballmer stunned onlookers by bounding around the stage screaming in excitement, sweat pouring down his shirt. Video footage of the extraordinary performance, titled "dancemonkeyboy"





(view it on <http://www.ntk.net/ballmer/mirrors.html>), rapidly made its way around and the nickname stuck.

Machinima

Gamers have long been experimenting with extended cut-scenes but now they're turning them into mini "movies". Instead of just recording the action, the technique involves using the game characters like virtual actors, placing them in scenes and even giving them wardrobe changes and special features. Some movies even get soundtracks, and MTV in the US has even played a Machinima music video.

Hunter


It was a 75 cent accounting error that alerted Lawrence Berkeley Lab systems manager Cliff Stoll to the presence of an unauthorised user on his system. The hacker was Hunter, a loser who spent his time stealing sensitive military and security data.

A car air filter

Geordi's visor was a last-minute idea on the first day of shooting and was hurriedly made from a Fram-brand car air filter.

RFC 2324

Way before the Internet fridge, the Internet Society was on to the fact that the world (and its collective household appliances) would be networked. Of course. In 1998 a document was published to propose a control protocol for networked coffee pots. Ah, those wild and wacky days when everything was kinda ironic and still kinda earnest at the same time.

 *The Restaurant at the End of the Universe* is hosted by Max Quordlepleen, who guides hitchhikers and regulars through a menu of fine food — including the PanGalactic Gargle Blaster — fine wine, and a floor show featuring a boiling universe. Disciples of the Great Prophet Zarquon loved it, despite the staggering prices.

1.21 gigawatts

Great scott! How on Earth was the Doc gonna generate that kind of power in 1955? Especially when he can't even pronounce it proper like. Jigawatts?

David Braben

Okay, so he co-wrote it with Cambridge Uni chum Ian Bell for a bit of fun in 1982 between



Final Score

Okay, you've done the test and hopefully had some fun. In that spirit, here's your score card.

0-30 KID: You know so little about technology you deserve to shouted at repeatedly by Mifune. You could read APC the same way you jumped into the Armoured Personnel Unit, but even then you'd just be embarrassing yourself.

31-50 NEO: `j0 d00d, u r a 133t h4x0r, n n0t 4 14m3r 47 4ll. U h4v3 d4 sk1llz n r /\!/, lch ph33r1) :-P>>`

41-50 TRINITY: Your tech skills make you slightly cooler than Neo, so you shouldn't kill yourself too slowly just yet. You are a fine example of diminishing returns. Like Trinity, you start off cool, but get progressively lamer with scrutiny. Know your limitations, or quit while you're ahead.

51-70 MORPHEUS: A geek with a Messiah complex — the most annoying of all. You think you know everything, but you're just good at guessing. Like Morpheus, you are style over substance and people cringe when you start babbling your half-arsed gobbledegook. Maybe you get away with it in forums, but step off when someone informed shows up.

71-80 GHOST: You're better than average. In fact, like Ghost you've got some decent skills. But ultimately it's all just flashy moves and in the end, you fail. Just like you failed the Oracle, you failed us. You showed promise all the way, and then choked. You actually need to try harder, not just be a try-hard.

81-90 AGENT SMITH: So close, but so far. You amassed points like Smith replicated Smitty's. You had ambitions to own the competition. You coulda been a contender. All the signs were there; got the Geek chic thing happening, a bit of a following online, perhaps. The fact you aren't a teacher's pet getting full marks only adds to your street cred. But it's all for nothing if a lamer like Neo stumps you. Beneath the killer instinct and Bluetooth earpiece is just a loser with bad teeth.

91-100 NIOBE: How the hell did you do it?

You steered your brain through the test like Niobe steered the Hammer through a mechanical line. Well done. Like the coolest character in the worst-movie-ever, you have shown some worthy moxy. Your skills get respect. And like Niobe, all you need to do now is lighten up and get a life. Congratulations.

Answers compiled by William Maher, Dan Warne, Justin Kranz and Garth Montgomery

pints. By 1984, the game which is billed as the first 3D game for home computers received huge critical acclaim. Originally written for the BBC Micro, the Cobra MkIII space craft might have looked like Wonder Woman's invisible jet but that didn't matter. The game had a conscience. A dream. You got money from taking food from agricultural worlds to industrial worlds, and machinery on the return journey. Today Braben

heads up Frontier Developments and makes games for every console, PC platform and even Nokia Series 60 phones. [\[1\] \[2\]](#)

Unleash your inner geek!

The meek may inherit the earth... but this month, one lucky geek will inherit a mean multimedia machine courtesy of Intel and Optima!

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Windows:

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page 6 for a full listing.



Defaults are for dummies — it's time to put your stamp on the Windows operating system. Time to do Windows your way. Experts Serdar Yegulalp and James Bannan reveal how to tame, tune and take control of the OS.

One size rarely fits all, especially in the case of an OS. And, while Windows tries to please most of its users most of the time, it also drives some folk around the bend. Its users are diverse — it should be too.

Reworking Windows to match your needs usually begins when you get rid of the worst defaults in the out-of-the-box OS.

Next, discover power-user tricks to bend Windows to your way, including bettering its built-in apps with free programs and utilities.

Finally, give the OS an interfacelift, from personalised boot screens to the visual delights of system-wide skinning. As such, our cover CD set gives you a complete Windows customisation toolkit — including *all* the software used in this feature. You'll even find full versions of two of the best-ever tuning and tweaking tools: Tweak-Me for Windows 9x/Me, and Tweak-XP for Windows XP.

However, while many of the tips in this feature apply to Windows 9x and upwards,

we've focused on XP — not only because it's the most popular OS and the one with the richest customisation potential, but because it has a plethora of niggles in the name of being "user friendly".

TAMING THE BEAST

The first step in customising Windows is breaking its annoying habits. You'll be pleased to see fixes for each. (Note, you need to reboot if you apply changes to the registry.)

Balloons begone: Of all XP's new features, pop-up balloon tips are the most irritating. While some novices find their explanations useful (for about 10 minutes), experts

despise them. To remove balloon tips, go to HKEY_CURRENT_USER\Software\Microsoft\Windows\CurrentVersion\Explorer\Advanced and set or create the REG_DWORD value EnableBalloonTips as 0 (as either hex or decimal).

Get less personal: By default, Windows Me (and XP in "Classic" Start menu mode) collapses the Start menu so it shows only commonly-used applications. To view all your apps, go to Start > Settings > Taskbar & Start Menu, and uncheck the Use Personalized Menus option. In XP, go to Start > Settings > Taskbar and Start Menu, click on the Start Menu tab, select Classic Start Menu > Customize, and at the bottom of the Advanced Start menu options list, uncheck Use Personalized Menus.

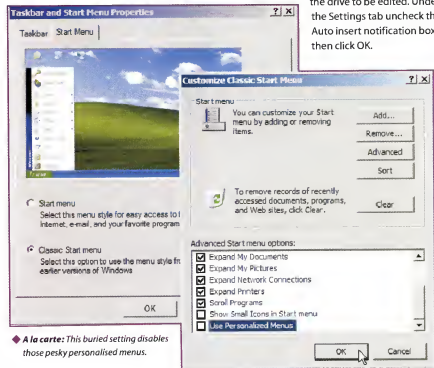
Disintegrating Internet Explorer: Contrary to Microsoft's claims, IE can be uncoupled from the Windows shell — at least in the case of Windows 98, 98SE and Me. This has the dual advantage of boosting performance slightly and removing distracting folder options, including folders that look like Web pages and those annoying "Do not tamper!"

warnings when you open a system folder. You'll also lose some useful features, such as the Quick Launch icons on the Taskbar, which are generated by the browser code. You'll still have the Web browser — It just won't be woven into the OS. To remove IE integration get the free IE-OFF utility from Annoyances.org, which is included on this month's cover CD set.

Over-riding CD AutoRun: Slot any CD or DVD into XP and you're assaulted by a host of contextual actions, thanks to AutoRun. To stop AutoRun from time to time, hold down Shift when you load the disc. To disable it for good, navigate to KEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\Cdrom and set the REG_DWORD value AutoRun to 0.

The AutoRunAlwaysDisable key contains the hardware names of devices that always have AutoRun disabled (such as multi-CD changers). To add a device to this list, find its exact name in Hardware Manager and type it on a line by itself.

In Windows 98/Me, open Control Panel, double-click on the System icon and select the Device Manager tab. Expand the CD-ROM branch of the device tree and double-click on the drive to be edited. Under the Settings tab uncheck the Auto insert notification box, then click OK.



◆ **A la carte:** This buried setting disables those pesky personalised menus.

Disable and Gump Windows Messenger

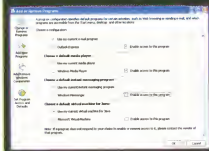
Perhaps the most exasperating Windows feature of all is Windows Messenger, the built-in IM app that seems to hang around whatever you do. This persistent pest can even be invoked by something as innocuous as opening a Web page. Most disabled Messenger by opening it, selecting Tools > Options > Preferences, and unchecking Run This Program when Windows starts and Allow This Program to run in the background. While this at least keeps Messenger from kicking in when Outlook Express is launched, it isn't a permanent solution.

Windows XP Service Pack 1 and Service Pack 3 for Windows 2000 went a bit further towards fixing this problem. SP1 included the Set Program Access and Defaults function (in Add or Remove Programs), allowing users to disable Messenger and hide it from view. Unfortunately, Messenger still wasn't completely uninstalled. So, is there a way to completely toss this bad penny? Yes, there is. From a command line, type:

```
RunDll32 advpack.dll,  
Launchinfsection %windir%\inf\  
mmsg.inf,btc.remove
```

(%windir% is a variable that always refers to the location of the Windows directory, regardless of the drive it's on or what it's called).

If you run Outlook Express with the Contacts pane enabled, you might notice that it takes a long time to launch after performing this operation. To fix this, either turn off the Contacts pane or go to HKEY_LOCAL_MACHINE\Software\Microsoft\Outlook Express and add or edit a REG_DWORD value named Hide Messenger — set this to 2.



◆ **Shoot the Messenger:** hide it from the user with Program Access and Defaults.

Write your own script

Many common Windows commands can be automated using the Windows Scripting language. Here's a quick example of a script to shut down your PC with a single click. Open Notepad and type:

```
set WshShell = WScript.CreateObject("WScript.Shell")
WshShell.SendKeys "~(ESC)"
WScript.Sleep 10
WshShell.SendKeys "uu"
```

Save the file as **shutdown.vbs** (make sure Explorer is set to allow file extensions to be viewed and edited) and place the file anywhere on your hard drive. Create a shortcut to this file on the desktop or in the Quick Launch bar, and change the icon to the red "power off" button in the default SHELL32.dll library.

*For more info on scripting and many more examples, see "Script for Success," page 116.

Extend your control: By default, the Explorer file manager won't display or change file extensions. If you'd rather not be kept in the dark, go to Explorer's Tools > Folder Options, click View and uncheck Hide extensions for known file types. (In Windows 98 go to View > Folder Options.)

Report card: Whenever a program crashes in Windows XP, the OS offers to create an error report and submit it to Microsoft for further debugging.

If this gets in your way, disable it by clicking the System icon in Control Panel, then choosing Advanced > Error Reporting and select Disable Error Reporting.

Alternatively, choose whether to send errors for only the OS, for programs or for specific applications.

Bite those thumbnails: When Thumbnail mode is selected for a folder in XP, Explorer creates and stores thumbnails in the file THUMBS.DB. But thumbnailing is slow,

especially if the folder contains hundreds or thousands of images.

Other actions to that folder can slow down or stop completely during the thumbnailing process, making it seem that the folder (or the system) has locked up.

Also, thumbnails aren't very persistent: the thumbnail cache for a folder is recreated almost every time the folder is re-opened, slowing things down even further.

If you already use an image-managing program, you probably don't even need thumbnails.

To stop them being written to disk, navigate to HKEY_CURRENT_USER\Software\Microsoft\Windows\CurrentVersion\Explorer. Advanced in the registry, create or edit the REG_DWORD value DisableThumbnailCache and set it to 1.

Confusing views: By default, XP uses the built-in Windows Picture and Fax Viewer for common image types, including BMP, GIF, PNG, TIF and JPG.

Annoyingly, associating another program with an image in the File Types window doesn't stop this — because XP differentiates between the View and Edit/Open actions.

What's worse, the Picture and Fax Viewer doesn't recognise all varieties of some image files, such as TIFFs with internal ZIP compression.

To get around this you need to make two registry edits allowing other programs to take over the default action for Picture and Fax Viewer.

In HKEY_CLASSES_ROOT\ShellImage\Associations\Image\ShellEx\ContextMenuHandlers, delete the ShellImagePreview key, then go to HKEY_CLASSES_ROOT\CLSID\{e84fda7c-1d6a-45f6-b725-cb260c236066}\shellex and delete the MayChangeDefaultMenu key.

This change takes effect immediately, so run the image editor or preview program of choice and set it as the default action for those file types.

Keep Explorer windows in their place:

When you log off or the system is shut down, Windows preserves information about all open Explorer windows. On the next login or boot, these windows are restored. This can be useful or it can be annoying.

To disable this for the sake of security (or just because it bothers you), navigate to HKEY_CURRENT_USER\Software\Microsoft\Windows\CurrentVersion\Policies\Explorer and add or edit a REG_BINARY value named NoSaveSettings. Set it to 01 (hex).

Share files like a pro: Most Windows 2000 users migrating to XP Professional hate XP's dumbed-down file sharing. To turn on 2000-style file sharing (with detailed access-control lists), in Explorer select Tools > Folder Options, click the View tab and under Advanced settings uncheck Use simple file sharing. Click Apply.

Warnings are for wusses: Both Windows 98/Me and XP pop up a warning message when disk-drive space is dangerously low.

This isn't always useful information, especially if you consistently fill disk partitions for a good reason, such as editing video or storing ISOs.

To disable these warnings in Windows 98 and Me, open Start > Programs > Accessories > System Tools > Disk Cleanup, select a drive, then under the Settings tab uncheck the Automatically run Disk Cleanup option.

In XP, open the registry and navigate to HKEY_CURRENT_USER\Software\Microsoft\Windows\CurrentVersion\Policies\Explorer and add or edit the REG_DWORD value NoLowDiskSpaceChecks. Set it to 1.

Be less sensitive: If you have a trackball, digitising tablet or other sensitive pointing device, you'll know all about VMS: vanishing menu syndrome. This occurs when your pointer inadvertently drifts towards a submenu in the Start menu, causing the menu you're browsing to instantly snap shut.



◆ **Turbo-charge the Task Bar:** A little bit of customisation goes a long way. This Quick Launch bar contains shortcuts for drives, applications and folders.

◆ **Tray magnifrique:** SysTrayX tames the Windows 9x System Tray.

To keep a tight rein on Windows, set menus to open only when clicked. In the registry, go to HKEY_CURRENT_USER\Control Panel\Desktop, and set the REG_SZ value MenuShowDelay to 65534.

BEND IT, SHAPE IT

Now you've tossed out and tweaked Windows' worst defaults, it's time to turn your hand to customising the OS to work your way.

Quirks of Quick Launch: The Quick Launch bar (in 98, Me, 2000 and XP) is the zippiest way to navigate Windows. Yet most people don't make the most of this handy acceleration feature. In fact, many users aren't even aware of it, since it's not turned on by default in XP.

Right-click on an empty space on the Toolbar, select Toolbars > Quick Launch, and a small panel of icons will appear on the Toolbar. If Quick Launch is locked into place in XP, free it up by right-clicking on the Taskbar again and selecting Lock Taskbar to remove the tick beside this option.

A small grab panel — which looks like a line of dots or a raised line — appears beside Quick Launch. Grasp this to resize the bar or move it to a more comfortable spot on screen — many users like Quick Launch at the extreme left or right of the Taskbar.

When Quick Launch fills up with more icons than can be displayed, a small chevron (v) appears at its edge; click this and the hidden icons pop up.

To add an icon to Quick Launch, right-click and drag it directly into the bar — making sure the cursor changes into an I-beam — then drop it into place.

Alternatively, drop in a whole host of icons by right-clicking on an empty spot on the bar and selecting Open Folder. Quick Launch opens as a folder, so you can add and rearrange items without any trouble. Pop your favourite programs here, then file them alphabetically for speedy access. It beats trawling through the Start menu, which

is even more awkward in XP, where it files programs by usage.

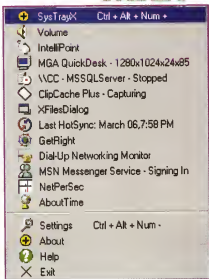
By default, Quick Launch includes the Show Desktop icon, IE and Windows Media Player, but you can throw on shortcuts to any program, folder, document or drive (local, network or removable). Note though, if you accidentally drop a copy of a program that's installed in another directory into Quick Launch, it may behave strangely when activated, so make sure you copy shortcuts rather than programs.

Bar trek: The Quick Launch bar isn't the only Taskbar toolbar. To meet the rest, right-click the Taskbar, then select Toolbars. They're all worth a look, although LAN and broadband users won't want to miss the Address bar. This tucks a URL pane into the Taskbar, so you can enter a site address and have the browser automatically fire up (instead of launching the browser and then entering the address).

A smarter starter: The big green cough lolly that is Windows XP's Start button has both fans and detractors. Okay, so it's mainly detractors. But at least it's highly configurable. Users with a very high-resolution display (1,280 x 1,024 or higher) can take advantage of this by making the Start menu fill more vertical space, so previously opened programs sit in the bottom of the left-hand column.

To do this, right-click on the Start button, select Properties > Start Menu, select the Start menu radio button, click Customize, and ramp up the Number of programs on Start menu counter; try setting it to 8 or 10 for starters. (To use even more of the existing space, choose Small Icons instead of Large icons.) Back in Start > Programs you can also set which apps appear on the Start menu by right-clicking their shortcuts and selecting Pin to Start menu.

A tinier Tray: The Tray area in Windows XP can be set to collapse automatically, and



customised to control which apps collapse and which always appear. Over time, many application references are no longer valid and simply take up space in the registry.

To clear them out (and avoid possible conflicts with other applications), edit HKEY_CURRENT_USER\Software\Microsoft\Windows\CurrentVersion\Explorer\TaskbarNotify and delete the PastIconsStream value.

To ensure the list isn't resurrected, kill all instances of Explorer.exe from the Task Manager, then log off. Unfortunately, there's no way yet to edit the list selectively, even with a third-party program.

Windows 98 users who want this functionality should check out the shareware app SysTrayX (www.sysstrayx.com), which does the same thing and is, in some ways, more configurable. Windows XP users can always disable XP's native function which hides Tray icons, if they prefer.

Open/Save as you like it: The common Open/Save dialogs in Windows 2000 and XP can be customised to some degree. It's possible, for instance, to edit the five quick-location icons on the left side of these dialogs. By default these are My Recent Documents, Desktop, My Documents, My Computer, and My Network Places.

To change this (and other aspects of Open/Save) in the registry navigate to HKEY_CURRENT_USER\Software\Microsoft\Windows\CurrentVersion\Policies and add or edit a new



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key named Comd32. Here, set the following REG_DWORD values:

NoFileMenu: Set to 0 to provide a dropdown list of recently used files in the File name box. Set to 1 to disable this.

NoBackButton: Set to 0 to enable the Back button; set to 1 to disable it.

NoPlacesBar: Set to 0 to show the left-hand shortcut bar; set to 1 to remove it.

If NoPlacesBar is set to 0 (or that value is missing entirely), the five place locations can be configured. Add a key under Comd32 named PlacesBar, and there add five REG_DWORD values named Place0 through Place4 (top to bottom). Set the value of each Place to one of the following:

00	Current Desktop
05	My Documents
06	Favorites
08	Recent
10	Desktop folder for current user
11	My Computer
12	Network Neighborhood
13	Network Neighborhood for current user
19	Desktop folder for all users
22	History
27	My Pictures

Alternatively, create Place0 through Place4 as REG_SZ (a string value, not a number) and set them to the full pathname of a folder to be specified by that location. (Path variables are valid, so a path of %SystemRoot% would link to the Windows directory, wherever it is.) These changes are all on a per-user basis.

Note that some apps, such as Microsoft Office, have their own variant of the Open/Save dialog, which needs to be customised separately. Microsoft offers information on how to do this in Knowledge Base article 205041 "OFF 2000: How to Customize the Places Bar" at <http://support.microsoft.com/default.aspx?scid=kb;en-us;205041>.

Other ways to whiz to commonly-used folders include placing folder shortcuts in Quick Launch, or using a FastFolder (www.dogkennels.net/fastfolder/), which places a list of commonly used folders on a Tray icon.

Right-click, right here, right now: The right-click context menu is another native feature that should get more of a workout. From this menu use SendTo to dispatch a file to a drive or folder, or to use a program as a drop target for a file (an alternative to Open With).

This is one of the easiest right-click items to customise. Hit Start > Run, type SendTo in the dialog box to open the SendTo folder then drop shortcuts to the desired locations or programs into the folder.

Try loading a shortcut to the Desktop folder, so you can choose between Windows' default of placing a shortcut to the chosen object onto the desktop, or moving the file itself there.

If you send a file into an application shortcut, that app will open and load the document. Even a shortcut to the SendTo folder itself can be used as a target — a convenient way to add a target without opening the folder.

Dead or deleted programs sometimes leave entries in the New submenu of a right-click menu. Several programs can help delete these spurious entries, such as Microsoft's own PowerToys XP, Xteq's X-Setup (www.xteq.com), or mwcStudio's ShellNewARE freeware (www14.brinkster.com/mwc/programs/shellnewar).

To remove these manually, navigate to HKEY_LOCAL_MACHINE\SOFTWARE\Classes and look for a subkey named after the file type created by the key's entry in the New menu. Inside that key is another subkey named ShellNew; delete or rename this to remove the entry from the New menu.

This process can be tiresome, so it's worth using a third-party app if you have to eliminate numerous file extensions.

You must remember this: You've probably noticed how some don't "remember" their settings; things such as the folder view or number of columns. By default, Windows only tracks the status of about 400 folders.

This may sound like a lot, but this quota gets used up very quickly on a busy system.

If you like your folders just so, raise this number by navigating to HKEY_CURRENT_USER\Software\Microsoft\Windows\Shell and adding a REG_DWORD value named BagMRU Size, which should be set to 1024 (decimal).

Using BootXP to create a custom boot screen in Windows XP

If you plan to add a custom startup screen to the Windows XP kernel, you have a difficult job ahead. That is, unless, you take advantage of the shareware program BootXP. Here's a step-by-step guide to how it works.

1 Use an image-editing program (such as Microsoft Paint or Adobe Photoshop) to create a 640 x 480 image to employ as the startup screen. This can be an existing image reduced to fit, or one created from scratch. Make sure the image is set to 16-colors, because while BootXP can convert an image to this setting, odds are that an image editor can do a better job.

Be sure to include space in the middle of the image for the progress bar. While it doesn't matter too much where you leave space (as the vertical position of the progress bar can be moved) plan ahead so the bar won't obscure anything.

- Save the image as a Windows-format bitmap (either 4- or 8-bit depth).
- Launch BootXP. The program will ask you to select which Windows installation to edit (if more than one is located on the system). Choose the version to customise, then click Save and Run BootXP. The program creates a backup copy of BOOT.INI's boot references and of the kernel; if something goes wrong the backup kernel can be booted to restart Windows normally.
- Click Browse to move to the folder containing the boot-screen bitmaps. Here select the boot screen to apply. The image appears under Source Image.
- Click Convert to Boot to translate the image to the appropriate format. The new image appears under Boot Screen.
- Click Preview Boot Screen to see a copy of the converted screen. Click in the middle of the screen to move the progress bar, then drag this to the required position. Once you're done, close the window.
- Click Set As Your Boot Screen to patch the kernel with the new boot screen. The image appears on the next boot.

To restore the original kernel and BOOT.INI file, click the Options tab, click first on Reset your Kernel File, then on Restore your BOOT.INI Backup.

◆ **Return to sender:** Put shortcuts to folders, drives and apps in the SendTo

Add the same value in HKEY_CURRENT_USER\Software\Microsoft\Windows\Shell\NoRoam and at least 1,000 folders should retain their views.

When installed, many programs place copies of their shortcuts in the All Users menu as well as that of the current user.

If only one user exists on the system, their menu can be deleted or merged with the All Users menu to save space and keep things consistent.

THE REPLACEMENT KILLERS

How many times have you fired up one of Windows' bundled apps and wished that Microsoft had worked just a *little* harder? Here are some fab and fully free programs that out-gun what Windows gives you.

AB Commander Lite: Back when Windows 3.x was king, plenty of companies churned out alternatives to the File Manager.

As Windows matured, the desire for third-party replacements seemed to wane — we can't quite figure out why, because XP's Explorer still leaves much to be desired, at least for power users.

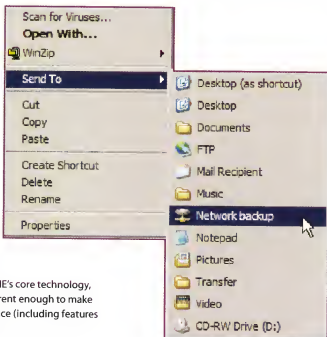
If you're tired of making excuses for Explorer, try AB Commander Lite. This is a free file manager with oodles of options and plenty of attitude!

Mozilla, Opera and Avant Browser: If you hate IE, then trash it. Really. Mozilla 1.5, the core of Netscape 7, is one of the best, most feature-rich browsers around. Fans of fast, lightweight programs will prefer FireBird or Opera.

Avant Browser uses IE's core technology, but in a way that's different enough to make it a whole new experience (including features like tabbed browsing).

Free Agent and XNews: While Outlook Express is a decent enough mail client, it's clumsy for tapping into Usenet newsgroups, and doesn't support newer features like the yEnc binary encoding standard. Two excellent free Windows newsgroupers trump OE in this department. Free Agent and XNews. While both have a wide user base, they have different interfaces: Free Agent is better for casual users, while XNews is for experts.

Process Explorer: Task Manager is another application that could be better. Consider



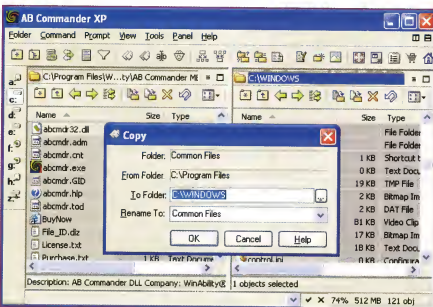
Sysinternals' Process Explorer, which allows users to do everything from kill individual threads to show selective information about processes. Users who want to know which DLL is hanging up what application will wonder why this program is free.

Edit Pad Lite: The ubiquitous Notepad has seen countless competitors, but among the best free programs is Edit Pad Lite, which breaks many of Notepad's taboos: unlimited file sizes, tabbed windows, Unicode/Far Eastern language support, and much more.

ZoneAlarm and Kerio Personal Firewall: XP's Internet Connection Firewall is another program you'll quickly outgrow. While the free edition of ZoneAlarm provides only a basic firewall, even this beats Windows' own ICF. Another product that's free for personal use is Kerio Personal Firewall, which is both easy to use and more flexible than ICF.

SIX APPS THAT MICROSOFT FORGOT Notwithstanding all the things Microsoft crammed into Windows, it skipped a few decidedly useful programs. Here are six ways to fill the gaps, all of them for free.

An FTP client: You might not know that IE has a "folder-view" FTP system; but then again, you might not want to know. It's clunky, cumbersome and has an atrocious habit of hanging up Explorer at the worst possible moment. There's a command-line FTP client, of course, but it's even more of a pain for serious



◆ **Master and Commander:** AB Commander Lite is a superb replacement for Explorer

◆ **Boot scooting:** swap Windows start-up screens for an image of your own

While this is not something to do casually (one mistake could trash the entire system), thankfully there are third-party apps to take the burden off the user.

One such (free) application is BootXP (www.bootxp.net), which allows users to switch in any of a number of startup screens and animations. Stardock's LogonStudio (www.stardock.com/products/logonstudio), which is also free, makes it easy to edit the XP logon screen without cumbersome patching—it will even randomly select a logon theme at startup.

Skinning by any other name: Even before XP was released, several companies produced skinning solutions for Windows 98/Me and 2000. The most successful was Stardock's WindowBlinds.

In some ways this system surpasses XP's native skinnability, allowing radical departures from the Windows look and feel.

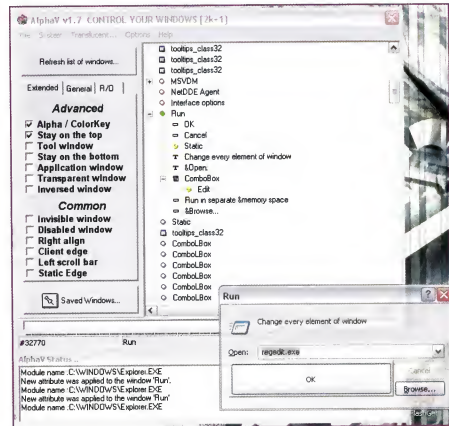


While the registered version has a wider range of skins, the free program is functional, giving users an insight into skinning and how it affects the system.

HoverDesk is another attractive program that gives Windows a radical makeover. Now entering its third revision, it allows any program to be skinned from the inside out, thanks to plug-in architecture.

Using a HoverDesk plug-in, you can, for instance, skin Winamp to match the rest of the system. HoverDesk also replaces the Start menu and Taskbar so they are functionally different, rather than just different to look at.

Unfortunately, while not a freebie, it has in-built content-creation tools so there's no need to download anything extra if you plan to build your own themes from scratch.



Take a pointer from us: One of Windows' first customisations was cursor sets, and this continues today. Stardock's free CursorXP (www.stardock.com/products/cursorxp) is a cool tool for creating custom sets.

To add a custom cursor, go to Control Panel, click the Mouse icon, from the Pointers tab select the cursor to change, click Browse, and choose a new cursor. Once you've updated all your cursors, click Save As and name the cursor set for future use.

To create custom icons for apps or desktop objects—you could try the freeware program IconArt.

See-through apps: If skinning seems a bit drastic, consider altering Windows by taking advantage of the alpha-channel function for graphics in Windows 2000/XP.

This allows an object to be rendered with a degree of transparency, from 0 (opaque) to 127 (see-through) and 255 (wholly invisible).

AlphaV is a top-notch program that allows you to set both alpha-channel values and heaps of other window-level attributes. It brings into play stacks of cool possibilities—like pasting a transparent instant messenger window on top of the Windows hierarchy so you can still read the window under it.

◆ **Peek-a-boo:** AlphaV lets you control the transparency of applications in Windows 2000 and XP.

Feature

Tweaking and twisting

Bonus CD software

Full versions of Tweak-XP Pro 2.0 (for Windows XP) and Tweak-Me Gold 1.0 (for Windows 98, 98SE and Me).



Serdar Yegulalp shows how to take control of the Windows box with your free full versions of Tweak-XP Pro and Tweak-Me Gold.

To complement this month's Windows feature, APC is delighted to present full versions of two award-winning tweaking tools from Totalidea Software. These aren't crippled "lite" versions or SE builds — they're fully functional programs that will help you tweak and optimise your Windows PC like never before.

Tweak-Me Gold is designed to bend Windows 98, 98SE and Me into shape, while Tweak-XP Pro puts you behind the wheel of Windows XP. Both operate as the Swiss army knives of Windows tuning, with dozens of ways to tailor the interface and boost performance, as well as aggregating several Windows settings into a single convenient control centre.

There's no need for risky registry hacking, and the program's simple interface and online help mean you can't go wrong.

These special versions of Tweak-Me and Tweak-XP don't include support

from Totalidea, but a set of FAQs at www.totalidea.com/tweakxp-faq.htm can help shed light on any problems.

GETTING STARTED

The first time you fire up either of these tweaking twins, the programs takes out a little insurance just in case things go wrong — this is Windows, after all.

Under Windows 98 and 98SE, Tweak-Me asks if you want to back up the registry and also gives you the opportunity to create a Registry Restore Boot Disk, which can recover the original registry in case of emergency.

Under Windows Me or XP, Tweak-XP Pro will prompt you to create a System Restore Point, which has the same net effect.

If this is your first time fiddling with system settings, you can dip your toes in the tweaking waters by invoking the System Optimization Wizard, which automatically applies a host of the best and safest tweaks.

This wizard's a bit bashful, though, being tucked away in the Hardware Tweaks section of both programs. But it's not just for beginners — you can run the routine if you're keen to see immediate improvements in performance.

However, the results may not always be obvious — and what's more, they may not be directly traceable to any one fix.

That's one of the advantages of going through the entire program panel by panel.

PURE PERFORMANCE

Altering cache sizes is a common Windows tweak, and you can experiment on your own PC by clicking the Cache icon in the System Performance group. Tweak-Me's cache settings are more involved than

those of Tweak-XP: you can set both minimum and maximum cache sizes, as well as the amount of information moved to or from the cache at once (the "chunk size").

The chunk size works best at 256KB, regardless of what the other settings are. Windows XP is far more efficient at handling things on its own, and needs little outside help. While you can still finetune things by changing the Windows XP cache, this has little real effect unless your PC has 512MB or more of memory.

The Memory Optimization section performs what could best be described as a "defrag" for RAM. Memory is allocated and retained as you open and close programs and documents, so the amount of free memory grows fragmented. Clicking the Optimize RAM button forces Windows to refresh the system memory and regroup all free RAM into a single contiguous chunk.

While this process can take some time and may substantially slow down the system while it's running, you'll be amazed at how much memory you can recover and the immediate effect it has on your PC's performance. Note, however, that checking the Force Windows To Unload DLLs From Memory option may cause some programs to crash.

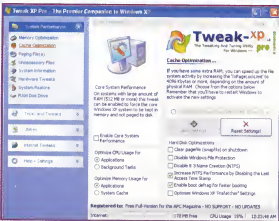
For more precise control, check the box marked Specify How Much Memory and set the amount to pre-allocate. The optimum setting of half of your PC's physical RAM is chosen by default.

The Hardware Tweaks section sets up optimisations for specific PC chipsets, processors, video accelerators and other hardware. Be extremely careful here, as a wrong choice could cause instabilities. It's a good idea to know what components your system has before you dive in.

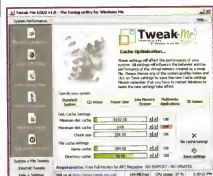
To check your PC's hardware and chipsets, right-click the desktop My Computer icon and select Properties; for video hardware, right-click on the Desktop, select Properties and click the Settings tab.

In XP, there's also an option to enable UDMA66 high-speed hard disk mode for Intel chipsets, which should only be activated if you're running an Intel chipset and Windows XP Service Pack 1.

The items in Tweak-Me's Boot Tweaks section apply to Windows 98, 98SE and Me only. Three of them — disabling DriveSpace,



◆ **XPress lane:** Tweak-XP Pro's optimisation icons include disabling the NTFS last-access time stamp and the paging of the kernel out to disk.



◆ **Cache convertor:** Tweak-Me Gold's Cache Optimization functions are more detailed than those for Windows XP, but only because a 9x-based OS has more primitive memory management.

DoubleSpace and the double-buffering driver — should definitely be enabled, as they'll boost Windows' boot times. The rest are optional, but can be useful when needed, such as forcing the boot menu to appear.

Modem and network tweaks are at least as controversial as hacking cache settings; the wrong settings make network and Internet speeds slower, not faster.

For instance, the Maximum Transmission Unit (MTU) network value, which can be edited directly in Tweak-Me, usually works best at 1,500 for Ethernet networks, but for dialup and ADSL Internet access many PPP gateways are hardwired to use an MTU of 576. The rule is: when in doubt, don't fiddle about. Just leave the settings as they are.

A worthwhile adjustment in Tweak-XP is to increase the number of HTTP sessions per server. On fast broadband connections, this boosts the load time for Web pages, since more parts of the page can be downloaded in parallel.

Both editions of the program allow the user to edit cookies, cached files, IE history and set other IE options (such as the animated IE logo) in sections of the Internet Tweaks



◆ **Happy hardware:** Tweak-XP's Hardware Tweaks section has options for different chipsets and video controllers, and also features the one-click Optimization Wizard.

◆ **World Wide Whoosh:** Tweak-Me can speed-up LAN connections, as well as dialup and broadband Internet.

category.

Paging Files (in Tweak-XP only) adds and controls the properties for up to three system paging files. The best place for a paging file is on a separate physical drive from the operating system — not just a separate partition on the same drive, but an entirely different drive.

COOL TWEAKING TOOLS

The Unnecessary Files utility hunts through the system for anything that can be safely removed. This includes many different types of files (leftovers from disk checks), and scads of other files that serve no useful purpose.

Use care when purging these files: don't delete backup copies that may be needed, such as system files.

The RAM Drive is a favourite from the old days of DOS, letting you dedicate a section of memory as a virtual hard drive for running applications and accessing data at light-speed.

Tweak-XP recommends using a RAM drive to cache temporary Internet files — an interesting idea, although the cache vanishes on reboot, which means this isn't as stable an option as using a hard-drive folder.

Also, some argue that the efficiency of Windows' disk caching makes RAM drives irrelevant, but it's worth trying to see if it works for you. Both editions of the program include a host of handy little utilities. Time Synchronization, which corrects your clock by checking it against a highly accurate atomic clock-time server on the Internet, is less useful for users of XP than 9x/Me as the former already has this function built in.

The File Renamer and File Shredder are delightful: the Renamer performs mass file renames easily (something that otherwise requires a lot of linking around at the command line), and Shredder securely destroys files by repeatedly overwriting them.

Password Generator creates secure passwords of various lengths and automatically copies them to the clipboard.

FOR XP ONLY

Tweak-XP has several extra features that don't appear in Tweak-Me. Folder Protection can hide folders and password-protect them, and includes a function to disable command



line access to further guard against prying eyes. Censored Applications ensures certain programs will never be run or installed (such as instant messengers or game apps).

Auto-Shutdown forces a shutdown, reboot or log off at a specific time. The Registry Cleaner scans the registry for keys that refer to invalid file paths and directories, although it won't search for invalid OLE/DDE references (a common reason for cluttered registries and bizarre PC behaviour), so use it carefully. DiscDrive Doctor is basically a front end for the CHKDSK utility and its command line switches.

Backup Windows Activation preserves a copy of the product activation keys for Office and Windows XP as a way to keep Product Activation from kicking in if someone makes, and then undoes, a change to the hardware (though this won't allow you to circumvent Product Activation entirely).

But wait, there's more!

If you like Tweak-XP, you'll love Tweak-XP 3.0, which takes your mastery of Windows to the next level. The improved IE ad blocker now slam-dunks those annoying pop-up ads and stops spoofer and spammers from activating the Messenger networking app. New features include virtual desktops, registry backup and restore, a ZIP file repair and integrity-checking utility, scheduled RAM optimisations, an automatic wallpaper changer, and much more. Check it out at www.totalidea.com and download the 30-day trial version. However, if you load the version 3.0 trial on a system running the full edition of Tweak-XP Pro 2.0, it'll overwrite the older version with the newer one, so once the trial period expires you'll need to reinstall Tweak-XP 3.0 or re-install Tweak-XP Pro then re-apply your system settings.

Feature

Windows Server power tips

It's time to show Windows Server who's boss. Expert Serdar Yegulalp reveals how to tame the beast.

MOVING WINDOWS TO ANOTHER PARTITION OR HARD DRIVE ON THE SAME SYSTEM

Odds are, you've experienced the following scenario more than once. You have a Windows 2000 system, tweaked and tuned just the way you want it, with all the applications you need and everything as it should be. Except for one thing: the hard drive. There's only a 20GB partition available for the operating system, and you want to move the OS to the jumbo drive you just bought — without tediously having to reinstall everything.

(Note: I owe thanks to Viktor Heimonen for the details of this trick. You can visit his Web site at <http://netti.nic.fi/~point>.)

Overview: In some cases you can solve the problem by using a partition-copying utility such as PowerQuest's PartitionMagic, but what if you want to preserve your existing drive lettering or partition layout? This can often turn a simple operation into a huge headache, and you may find yourself with a host of unintentionally broken applications because of bad drive mappings. Worse still, it might result in a completely unbootable system, since many drive letter references are hard-wired into the registry and can't be easily swapped out.

Sometimes the only way to do this properly is to relocate the OS "by hand" — in other words, by manually copying Windows to another partition and hacking its drive-letter references directly.

The party line: Microsoft's official stance on moving Windows between partitions or hard drives can be summed up in one word: No. Like a lot of other procedures that involve major-league fiddling with the location of the Windows binaries, it frowns on this

heavily. It's not hard to see why: any operation that involves moving Windows around is inherently dangerous, because you can screw up your system for keeps. Microsoft does talk about using a parallel installation of Windows for rescue operations, but the trick we'll look at here is of a different ilk.

The undocumented solution: With a little planning and forethought, it's possible to relocate your OS safely to any partition you like without breaking everything or rendering your system unbootable.

What you'll need: Your new hard drive(s), of course, and a partition-copying program, or the installation CD for your OS.

If you don't have a commercial partition-copying program, look into BootIt Next Generation from Terabyte Unlimited at www.terabyteunlimited.com.

This inexpensive partition-copying program is just as good as any pricey commercial product. Note also that some hard drives come with partition-copying applications (Western Digital's drives, for instance), but some of these only work to or from that particular manufacturer's brand of drives.

To move Windows to another partition or between hard drives on the same system, follow these steps:

1. Install and prepare the new hard disk's partitions. You can do this either with your existing Windows installation, or with the utilities provided with many hard drives. Whichever course you take, make sure the new partition has a drive letter assigned to it before continuing.
2. This step — copying the OS directory over to the new hard drive — can be accomplished in several ways.

One possible method is to make a parallel installation of Windows 2000 that is nothing but the OS — no additional programs, nothing else — boot into it, and copy the original OS directory using the `xcopy` command.

However, finding the right target location for the temporary OS can be a little troublesome: if you put it into the same partition as either your source or target partition, problems can develop.

For instance, if you install it on the same partition as your existing copy of Windows, your Documents and Settings folder will be trashed. Put it on the target partition and the existing Documents and Settings folder may not copy over correctly, since it's "in use" while you're copying.

The solution? Image the partition, then boot back into your regular Windows installation to perform the rest of this trick. If you do wind up using a "rescue OS" installation to do the copying, be sure to use the command-line `xcopy` function. *Don't use Explorer.*

Assuming C: is your source drive and D: is your target drive, use `xcopy` like this:

```
xcopy c:\*.* d:/e/k/l/x/h/o/a/g
```

Server undocumented

The extract in these pages comes from Serdar Yegulalp's new book, *Windows Server Undocumented Solutions: Beyond the Knowledge Base*, published by McGraw-Hill (ISBN 0072229411). This is but a taste of what you'll find packed in this 320-page tome for network admins running Windows Server 2000 or 2003. Serdar details techniques ranging from autopilot setup and hardware and memory optimisation to networking, migration, management and living with the quirks of IIS and Active Directory.

Windows Server Undocumented Solutions: Beyond the Knowledge Base is available now for \$74.95.



◆ **Buzzword:** loading the hive into the registry.

The switches with xcopy ensure that everything, including hidden and system files, are copied over, with their NTFS metadata intact. This is *extremely important* — if you copy over the files without preserving their NTFS permissions and ownership information, the resulting copy of the OS will not work correctly.

What's worse, this may not be immediately apparent. I've seen people copy over the OS, boot it, then get as far as the login screen before experiencing an error. This is yet another reason why making a disk image of the original partition may not be a bad idea, since it eliminates many of these variables in one fell swoop.

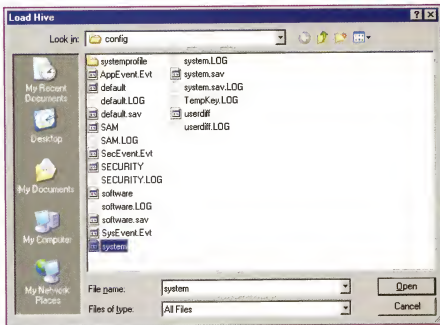
If you use a partition-copying tool to make the copy, check that the program supports what is referred to as "forensic mode". This ensures the copy is an exact bit-for-bit replica of the original and has not been time-stamped or otherwise messed with. Norton Ghost, for instance, explicitly supports forensic copying.

Now edit your system's BOOT.INI file to contain an entry pointing to the new copy of Windows. Usually the easiest way to do this is to copy an existing line from BOOT.INI and edit this, although if you're dealing with an exotic combination of controllers or disks you may need to fiddle with the entries to get the right one.

Creating a BOOT.INI entry for another partition or hard drive is somewhat outside the scope of this discussion, but if you want the lowdown on how to do this, see Microsoft Knowledge Base article 102873, "BOOT.INI and ARC Path Naming Conventions and Usage".

Make sure this new BOOT.INI line has a distinctive name — "New Windows Installation" should do the trick.

- ③ Start REGEDIT32 (not REGEDIT — there's a big difference!) and select Load Hive from the registry menu. Go to the %SystemRoot%\System32\Config folder in your copied Windows installation (where %SystemRoot% is, of course, the name of the system folder — usually Windows) and open the file named "system", as shown in the screenshot above. Give this hive file a name — "Temp" will do just fine. The hive file will appear as a new branch of the registry.



- ④ Open the new registry branch, then the subkey MountedDevices. In here, look for two subkeys in the right-hand pane with the drive letters of the source and destination partitions.
- ⑤ Open Notepad or another text editor, double-click the subkeys in question, and copy their binary values to Notepad. Make certain you label them so you know which is which, and be sure to copy and paste in Hex mode.
- ⑥ Swap the binary values for the two subkeys, so that the source drive has the target drive's binary data, and vice versa.
- ⑦ Unload the hive from the registry menu and close REGEDIT32.
- ⑧ Reboot to the new installation of the OS. Note: When you move applications to another partition, the drive lettering of the destination partition should be exactly the same as the drive lettering in the original partition. In other words, if you had your applications on a drive named C:, they should still be on a drive named C: when you're finished. The last few steps of this operation ensure that's the case.

Moving your applications separately to another partition is way outside the scope of this book. In fact, I'd suggest that your best bet is just to uninstall and reinstall the application in the new target partition.

OPTIMISING WINDOWS 2000 PROCESSOR TIME

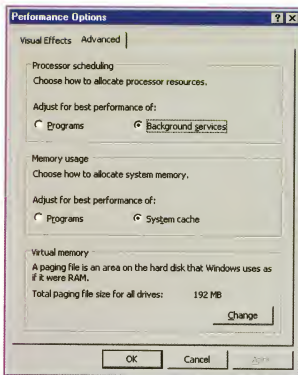
Windows 2000 maintains a set of defaults that control how much processor time is

allocated to a thread, and also the relative time allocated to threads in the foreground, versus threads in the background.

By default, the settings in Windows 2000/2003 server provide foreground and background threads with equal processing priority. The importance of the thread cycle, or quantum, only really becomes significant on a system in which 100% of the CPU is utilised. With that in mind, the best way to use this tweak is on a system that has intense background processes running, but on which, when someone uses the console directly, they receive priority.

Overview: While the out-of-the-box tunings for these settings are good for most machines, a discriminating administrator may want to perfect them. For instance, a system with virtually no desktop or user interface activity may perform better if tuned to prioritise background processes. That way, even if someone logs on to the system locally, the machine will focus on its back-end functions, not on what's running in the foreground (which, for a server, is as it should be).

The party line: Microsoft has actually exposed part of the functionality for this setting without requiring a registry edit. To adjust whether Windows prioritises foreground or background processes, open the Control Panel, then launch System. Here, select the Advanced tab, and in the Performance area click on the Settings button. Here, click the Advanced tab (as shown in the screenshot above), and make



your selections. However, since there's no way here to change the other settings that govern this behaviour, it's time to do a little registry-hacking.

The undocumented solution: A registry setting named `Win32PrioritySeparation` controls how threads are handled by the processor. As this setting is a bitmask, it requires some deciphering to use it correctly, as well as a little planning to ensure the values you employ best complement the server type you're using.

What you'll need: A registry editor, such as REGEDIT or REGEDT32.

Follow these steps to optimise Windows 2000 processor time:

- 1 Fire up the registry editor and navigate to `HKEY_LOCAL_MACHINE\System\CurrentControlSet\Control\PriorityControl`. `Win32PrioritySeparation` should appear in that subtree as a DWORD value.
- 2 `Win32PrioritySeparation` is a six-bit value. The default value is `0x02` (hex). The best way to determine the value for this entry is to fire up the Calculator applet, set it to binary mode (select Scientific under the View menu if you don't see the option to enter binary), compile the value you want to use from the choices below, switch the calculator to Hex or Dec(imal), then enter the value listed.

◆ **Who's on first?** The Advanced tab in Performance Options allows you to assign priority scheduling to either background or foreground services.

The two leftmost (or highest) bits represent how long scheduled threads are permitted to run. Setting these to 10 instructs them to run at shorter intervals, while 01 makes them run at longer intervals.

The two middle bits determine whether the length of each thread cycle, or quantum, is fixed or variable. This has several consequences: If set to fixed, the same quantum value applies for both background and foreground threads. If set to variable, the length of each thread's execution time will vary, but the ratio of foreground to

background time remains fixed. (However, we can change that to some degree as well — stayed tuned for more on this later). Set these bits to 10 to use variable-length quanta, or 10 to use fixed-length quanta.

The two leftmost (or lowest) bits, determine the ratio of foreground to background threads. A value of 00 means that foreground and background threads get the same ratio of time, and overrides any variable-length specification (determined by the setting of the middle bits). A value of 01 allocates twice the amount of time to foreground processes as to background processes. A value of 10 or 11 means foreground processes get three times as much processor time as background processes. However, be aware that these values apply to Windows 2000/2003 Server only, and are not valid for Windows 2000 clients or Windows XP Home or Professional. While they can be added to these systems, they won't be recognised.

- ◆ Set the value and reboot your computer.

DISABLING LAST-ACCESS TIME STAMP IN NTFS

NTFS tracks many different types of metadata for files, much more than FAT or FAT32. Some of this information pertains to permissions on files or objects, a portion is quota information, and another section is less frequently used

but still-useful metadata, including the last time a given file was accessed.

Overview: Any changes made to NTFS metadata require a certain number of disk operations. Even though Windows offers a good deal of intelligent disk caching, at some point data has to be written out to disk. The smaller the amount that actually needs to be written, the faster things move. To that end, there's a registry entry to allow users to disable the updating of the last-access time stamp for NTFS. By default, this function records the last time a given file was accessed in any form, whether for a read or write operation. Since this information isn't often useful, it can be disabled.

The party line: Microsoft does indeed mention disabling the last-access time stamp in passing, but not as a performance-enhancing measure. In a way, this is understandable, since this information is important for some people — for instance, those who work with file-repository servers. When Microsoft talks about this, it's only as a workaround for certain problems (such as in the Knowledge Base article 150355 "Windows NT Nonresponsive During NTFS Directory Traversal", an NT 3.51/4.0 problem that appears to have been corrected with a service pack), almost never as a generic performance-enhancing trick.

The undocumented solution: Disabling the time stamp does speed up performance on NTFS partitions a bit, since one less thing has to be written to disk. When doing this, however, consider whether the metadata is really important to you. If you can envision a case where it would be useful, leave it on. If you can't, shut it off. Of course, you can always re-enable it later.

If you have many directories containing thousands of files, the NTFS in-memory log buffer can fill up quickly with time stamp update operations, so disabling this is useful.

What you'll need: A registry editor, such as REGEDIT or REGEDT32.

Reboot after following these steps:

- ◆ Open the registry editor and navigate to the key `HKEY_LOCAL_MACHINE\System\`

CurrentControlSet\Control\FileSystem.

- ❶ Add a new DWORD value named "NtfsDisableLastAccessUpdate" and set it to 1. (To re-enable the last-access time stamp, set this value to 0 or delete the DWORD value completely).

DISABLING 8.3-STYLE FILENAME GENERATION IN NTFS

For the sake of backward compatibility, on each NTFS volume Windows maintains a store containing a copy of all filenames on that volume, rendered in abbreviated (DOS-style) 8.3 fashion. Names in 8.3-style have to be generated anew whenever a file is created, requiring a certain amount of overhead.

Overview: If you don't have DOS or Windows 3.x clients on your system, or if your programs don't require 8.3 filenames to work correctly (for example, 16-bit Windows or DOS command line programs), disable 8.3 filename creation and haul back some speed.

The party line: Microsoft points out several things about this trick that are worth keeping in mind. First, you can't use it on a file system accessed by any OS which uses only 8.3 filenames, such as DOS, Windows 3.x, or Windows for Workgroups 3.x. Second, be aware that this trick does not remove existing 8.3 name stores — it only stops the creation of new ones. Existing files with 8.3 names will continue to have 8.3 names, while any files created after applying this hack will not.

The undocumented solution: It's also worth keeping in mind a few things Microsoft does not point out.

Some 32-bit applications, including Intuit's Quicken 2003, won't install correctly unless 8.3 name creation is enabled. While many servers may not rely on programs that need this enabled to install correctly, be aware of it if problems arise.

I've been asked in the past how to remove the existing 8.3 namespace to free up room in the file system. There's no easy way to do this, aside from moving all the files off a given volume, disabling 8.3 name creation, reformatting the volume, and copying the files back. While you might gain a few megabytes by cleaning out an existing volume containing lot of files, whether

that little return is worth the investment of effort is up to you. In theory, removing namespace might also lessen the amount of NTFS directory structure fragmentation — but reformatting and recopying the disk's contents would likely do that anyway.

What you'll need: A registry editor, such as REGEDIT or REGEDT32.

Below are the steps for disabling 8.3 filename generation in NTFS:

- ❶ Open your registry editor and navigate to HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\FileSystem.
- ❷ Change the value of the subkey NtfsDisable8dot3NameCreation to 1.

ADDING AUTOCOMplete TO THE COMMAND-LINE INTERFACE

Administrators love the command line. It's unlikely anything will ever completely replace it, and for good reason: It's sometimes just easier to type commands than slog through the GUI to reach the right menu choices. To that end, the command-line interface (CLI) remains a continuing part of the Windows interface.

Overview: Possibly because it's so ubiquitous, the Windows command line is also a little limited. Although it's been augmented and bolstered with each successive version of Windows, at its core it's the same old CLI.

The party line: Microsoft doesn't aggressively document or promote additional features for CLI users, which probably comes as no big surprise. One of Windows' strengths is the classic Windows GUI, which is feature-heavy compared to the CLI. As a result, the GUI winds up with most of the interesting tweaks.

The undocumented solution: That said, some augmentations to the CLI (which are not turned on by default) can be quite useful. One of these is AutoComplete.

Windows NT, 2000, and XP provide the AutoComplete feature at the command prompt (cmd.exe). When activated, if you type a character followed by a special key, Windows will try to complete the command automatically using the files or directories in

the current directory — much in the same way that it tries to complete URLs in the Internet Explorer address bar. The system can be set to use different special keys to AutoComplete files and directories (although, by default, this feature is only turned on for files, not folders).

The AutoComplete key for files is the tab key. To edit this key, you'll need to change the registry entry controlling it.

What you'll need: A registry editor, such as REGEDIT or REGEDT32.

Reboot after following these steps:

- ❶ Open the registry and navigate to HKEY_CURRENT_USER\Software\Microsoft\Command Processor. However, if you want to make this change valid for all users — past, present and future — go instead to HKEY_LOCAL_MACHINE\Software\Microsoft\Command Processor.
- ❷ Add or edit the REG_DWORD value named CompletionChar. This sets the completion keystroke for filenames.
- ❸ Set CompletionChar to the hex value of the control character you want to use.
- ❹ To set the completion keystroke for path names, add or edit a REG_DWORD named PathCompletionChar and set it to the hex value of the selected key code as shown in the table below.

04	Ctrl+d
06	Ctrl+f
08	backspace
09	tab

- ❺ Reboot and test the AutoComplete function in a CMD session.

ADDING A DOS PROMPT/CLI PROMPT CONTEXT MENU TO FOLDERS AND DRIVES

As well as extending the command line itself, you can change how the CLI is invoked — for instance, through a right-click menu.

Overview: When a CLI prompt is launched (also generically referred to as a "DOS prompt," even though DOS doesn't exist in Windows 2000/2003), it usually opens in the Documents and Settings subfolder for the currently logged-in user. Most of the time, you'll want

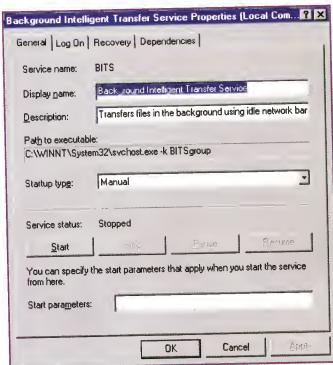
men's style

australia



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◆ **At your service:** the Background Intelligent Transfer Service shut off and set to manual.

to carry out file operations in another folder, so anything that can spare you the trouble of manually changing directories is worthwhile.

The party line: Normally you'd launch a DOS prompt from the Windows interface by starting the command prompt shortcut in the Start menu, or by going to the Run box and typing CMD to launch CMD.exe. While these are handy, it's even niftier to create a right-click context menu for any drive or folder, so you can launch a CLI directly from your current location.

The undocumented solution: To add a right-click context menu to invoke the DOS prompt you'll need to edit the registry in two places.

What you'll need: A registry editor, such as REGEDIT or REGEDT32.

Make the following changes, in the order shown below:

- 1 Open the registry and navigate to \HKEY_CLASSES_ROOT\Directory\Shell.
- 2 Create a new subkey named DosHere if there isn't already one present.
- 3 Edit the existing "(Default)" REG_SZ value in DosHere to read:

Dos & Prompt Here

- 4 Within DosHere, create a new subkey

named Command.

- 5 Edit the existing "(Default)" REG_SZ value under Command and set it to:

```
E:\WINDOWS\System32\cmd.exe /k
cd "%1"
```

- 6 Navigate to \HKEY_CLASSES_ROOT\Directory\Shell.
- 7 Create a new subkey named DosHere if there isn't already one present, and set its "(Default)" value to read:

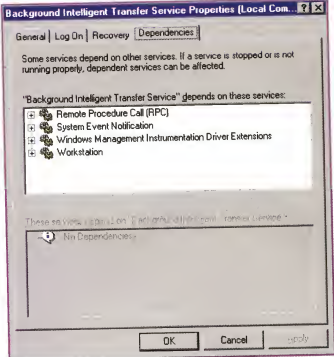
Dos & Prompt Here

- 8 Within DosHere, create a new subkey named Command.
- 9 Set the "(Default)" entry within it to the same value as that listed in step 5.
- 10 Log off and back on again. Now when you right-click files and folders, you'll see a context menu for launching a DOS prompt.

TURNING OFF UNUSED SERVICES TO FREE UP MEMORY

Many system services that are used intermittently (or never at all) can be shut off or disabled to save memory.

Overview: Because system services run invisibly in the background, they aren't as obvious as applications that hog memory.



◆ **Dependent no more:** the dependencies tab of the Background Intelligent Transfer Service. Since nothing is currently dependent on this service, it can be disabled.

What's more, several services running for no real purpose can create a significant memory drain on a server — even if swapped out to disk.

The party line: Microsoft takes the view that services should only be disabled if there is an overriding need — a stuck service, for instance, or one that must be turned off to prevent components conflicting.

However, Microsoft doesn't explicitly forbid shutting off certain services in an effort to save memory, especially if those are rarely or never used.

The undocumented solution: The table on page 112 lists common services that can be disabled with few or no side effects in Windows 2000/2003. These are generally set to run by default, even when not needed.

An example of a service's properties can be seen in the screenshot at the top left of this page.

Before disabling any services, it's prudent to determine whether any dependencies exist for that service by taking a look at the table above. To learn about a service's dependencies, double-click its entry in the Services management window and select the Dependencies tab. The bottom pane of the Dependencies tab lists which services are dependent on the

Service name	OS	Description	When to disable?
Alerter	2000/2003	Receives administrative alerts in a LAN.	A common target for spammers, so unless you use administrative alerts in your network, disable along with the Messenger service.
Automatic Updates	2000/2003	Used by Windows Update to download and install published system component updates and service packs.	Disabled automatically if you turn off Automatic Updates: In Windows 2000, from the Automatic Updates icon in the Control Panel; In Windows 2003, from the Automatic Updates tab in My Computer, Properties.
Background Intelligent Transfer Service	2000/2003	Works with Windows Update to transfer data in the background as needed to the system.	Disabled/enabled automatically with Windows Update.
Computer Browser	2000/2003	Maintains a list of all systems on the local network, which it provides on request to workstations.	Only one server per LAN should be running this. If you have multiple servers, turn the browser off on all but one to reduce NetBIOS "chatter".
DHCP Client	2000/2003	Assigns IP addresses and DNS records to the local machine via DHCP.	Only if DHCP is not in use.
Distributed Link-tracking Client/Server	2000/2003	Tracks linked files that are moved from one NTFS volume or system to another.	When link tracking is not needed (generally often).
Error-reporting Service	2003	Reports error information on crashed applications to Microsoft.	When extended error reporting is not needed.
Indexing Service	2000/2003	Indexes on-disk content for faster contextual searches.	When text searches are not being performed.
Print Spooler	2000/2003	Manages print jobs for applications and the system, including virtual printer drivers (such as the Adobe Acrobat output driver).	When printing is not used.
Remote Registry Service	2000/2003	Allows the remote manipulation of the registry on that machine.	When remote registry editing is not being performed (which is generally often).
Task Scheduler	2000/2003	Runs tasks automatically at a pre-scheduled time.	When task scheduling is not in use.
Wireless Zero Configuration	2003	Automatically configures 802.11 networking.	When wireless networks are not being used.

one in question. If the window is greyed out, then it's likely that the service can be stopped immediately without any problems occurring. An example of a service which doesn't have any dependencies, the Background Intelligent Transfer Service, is shown in the image in the top-right of page 111.

Note: The Dependencies window

generally only lists *running* components dependent on that service. If you later run a component dependent on a service that is turned off or disabled, you may receive an error message to the effect that the new service can't start. The lesson: be mindful when disabling services.

◆ **When to disable:** Windows 2000/2003 services that can be disabled, and when.

IMPROVING FILE- AND PRINTER-SHARING PERFORMANCE

File and printer sharing are two of the most common duties performed by Windows servers. While there's not much you can do to tune these settings externally, a little work under the hood can result in spectacular improvements.

Overview: Most administrators don't spend much time thinking about the performance of Windows file and printer sharing services: if it works, that's what matters. While high traffic, bad organisation, or slow network links can all cause problems with file and printer sharing, so can leaving the file and printer sharing settings untuned.

The party line: While Microsoft does offer some details on how to improve server service performance, it's only in the context of working around known bugs or other problems that don't fall into the realm of regular operations.

The undocumented solution: Since a great deal of file and printer sharing configuration isn't exposed through the administrator interface, you'll need to edit the registry to effect such changes.

What you'll need: A registry editor, such as REGEDIT or REGEDT32.

Reboot after following these steps:

- Open the registry and navigate to the key HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\lanmanserver\parameters.
- Add or edit a DWORD value named MaxWorkItems. This allows you to change the number of receive buffers set aside by the server service. These buffers store incoming data, so if the system runs out of these, no further data can be accepted until a buffer empties. In this case, file-copy operations would slow down drastically, and print jobs may be held up. For a heavily-used server, set the value to 65,535 to allocate the maximum number of buffers — about 4MB worth — into the system's non-paged pool memory. A word of warning, however: be careful with this setting, as increasing the use of non-paged pool memory

can destabilise some systems.

- ➊ Add or edit the DWORD value `MaxRawWorkItems`. This indicates the maximum number of raw receive buffers that the server can allocate. Set this to 512 (or higher) to ensure the server won't run out of raw receive buffers even under high loads.

- ➋ Add or edit the DWORD value `MaxFreeConnections`. This value governs the number of free connection blocks maintained for each endpoint (that is, for each remote host). Set this to 100 to keep the endpoints from running out of connections, and to allow for mass parallel copy operations.

Next, add a DWORD named `MinFreeConnections` and set this value to 32. This ensures that at least 32 connection blocks will be maintained for each endpoint. If you log many Event ID 2022 errors, setting this value may be the first and quickest step towards resolving the issue.

- ➌ Add or edit the DWORD value `MaxMpxCt`. This sets an upper boundary, negotiated and finalised between the server and the endpoint, stipulating how many concurrent outstanding network requests can exist between a client and a server.

`MaxMpxCt` defines the upper bound for the current machine as a server. Normally, this value should be set to 125. In Windows 2000 it can't be raised above that value (unless you are running Service Pack 1 or later), while in Windows 2003 you aren't limited. If you experience very high endpoint traffic — massive parallel copying operations, for instance — raising this is a good idea.

- ➍ Add or edit the DWORD value `MaxCmds`. This sets an upper bound, negotiated and finalised between the server and the endpoint, for the number of concurrent outstanding network requests that can exist between a client and a server.

`MaxCmds` defines the upper bound for the current machine as a client. The default of 50 can't be raised unless you are running Service Pack 1 or later for Windows 2000 (obviously this doesn't apply to Windows 2003).

Again, if you have excessive endpoint traffic, raising this is a good idea. Note,

however, that if you are using Windows 95 or Windows 98 clients with your server *do not change these values* since neither OS can function correctly if a larger value is negotiated during a network operation.

- ➎ Examine the DWORD value `EnableOplocks`. If this doesn't exist, the default value is 0. Setting this value to 1 disables the use of opportunistic locking on clients, placing a greater strain on the server and increasing the need for network work items.

If you are losing data over a WAN when using Microsoft File and Print Services, you may need to disable oplocks to prevent data loss at the expense of some performance.

Microsoft Knowledge Base article 129202, "PC Ext: Explanation of Opportunistic Locking on Windows NT", explains opportunistic locking in some detail and describes just when this should be disabled. Generally, this should not be changed unless you're experiencing extraordinary data loss in the way described.

- ➏ Examine the DWORD value `CachedOpenLimit`. If it doesn't exist, the value is 5. This controls how many file handles are cached by the server service, so that repeated open/close file operations can be buffered and therefore reused more efficiently.

At times this needs to be disabled or set to zero for compatibility. If under some circumstances you notice that a file being accessed across the network has a zero size, and access is consistently denied, or you see a great many unpredictable sharing violations, then setting this to 0 may help.

- ➐ Examine but do not initially change the DWORD values `MaxKeepSearch` (default: 1,800), `MinKeepSearch` (default: 480), and `MaxGlobalOpenSearch` (default: 4,096). These control how the results of directory searches are cached, so that search buffer memory can be reclaimed after a certain period of time.

Note that these values were originally created to manage memory for MS-DOS or non-Win32 applications that did not automatically close searches once completed. To save memory, therefore,

lower `MaxKeepSearch` and `MinKeepSearch` to make them more conservative and thus dispose of search memory sooner.

On the other hand, if directory search operations time out too soon or produce errors, raise these values.

To satisfy more simultaneous searches, raise `MaxGlobalOpenSearch` to 16,000 (decimal); the maximum for this value is 65,536.

- ➑ One of a number of backward-compatibility values that can also be placed in this key is the DWORD `EnableFWF311DirectIPX`. This allows Word for Windows clients that run IPX to connect to the server with greater success. Set it to 1 to enable this.
- ➒ Another backward-compatibility value for clients running direct-hosted IPX is the DWORD `ConnectionlessAutoDisc`, which measures in minutes how long a given client can idle before it is disconnected. The default is 15. If your clients are timing out too quickly, raise this value.
- ➓ Add or edit the DWORD value `AutoDisconnect`. This describes, in minutes, how long a given user's connection to the server is held open before being disconnected. The default setting for this is 15 minutes.

It's interesting to note that one of the ways `AutoDisconnect` is used — although this is not very scrupulous, if you ask me — is as a workaround to allow more users than would normally be allowed by the connection licensing to connect to a given server.

Usually this involves setting `AutoDisconnect` to a very low value, such as 1, to disconnect users immediately.

Since most users connect and then remain idle, by disconnecting them sooner the server makes it seem as if it can support a large number of connections at once.

Of course, this trick doesn't work with users who perform a lot of file-copying operations (or other tasks that require continuous connectivity), but it does allow slightly less active users to obtain slightly more user activity.

However, I must emphasise that this procedure can get around Microsoft's per-connection licensing. [\[11\]](#)

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WORKSHOP

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Bonus CD software

Most Workshop articles are accompanied by bonus software loaded onto our cover CD set — just look for this icon. This is often software that's integral to the article. The selection ranges from full-working versions and trial versions, to shareware and freeware.

APC can't provide tech support for these programs, but if you have a problem with the CD itself, by all means holler our way (see page 7 for how to contact our CD team).

This month's CD set includes Borland C++BuilderX, over 50 Adobe Photoshop plug-ins, Ximian Evolution 1.4 and a bunch of Multisync plug-ins, a handful of ebook apps (including readers, conversion tools and publishers) and lots more.

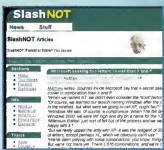
Site of the month SlashNOT

Satirical pages like *The Onion* and *BBSpot* have been APC favourites for years, but we've recently come across *SlashNOT* (www.slashnot.com).

It's a sardonic recreation of the leading tech and geek culture news site, and provides articles on products like the imaginary

Apple iClose, or Intel's new line of processors, which reportedly ships under the "Sexium" moniker. The page design is almost identical to *Slashdot*'s layout, and the tone of each article is generally so dry that you have to double-check the browser's title bar to confirm which site you're viewing. Regular sections include *Floshnot*, which looks at fictitious events in computing history, like the release of Windows 200, which is described as "a large rock wall with a hole in it," that was "...marketed as both a firewall and a commerce portal — the first such product to incorporate security and accessibility in a single product."

Also be sure to check out *SlashNOT*'s sister site, *CNNOT* (www.cnnot.com). Just don't take anything you read there too seriously — the site managers certainly don't.



All code fragments and examples given in Workshop articles are for demonstrative purposes only.



Script for success, Part 1

The Script Host holds the key to automating and simplifying a myriad of tasks under Windows.

Serdar Yegulalp helps you get the most from it.

Among all the important things you do on your PC each day, there are also dozens of little routine tasks that eat up your time — from shutting down or rebooting Windows to renaming files, or changing system settings en masse. But why should you sweat the small stuff when you can hand the drudge work over to the OS?

Under the hood of Windows lurks the widely under-utilised (and in some cases entirely misunderstood) Windows Script technology. This modern-day version of the old DOS batch file lets you assemble whole sets of Windows commands and functions into scripts that can be run on yours, or anyone else's, PC.

This Workshop is the first in a three-part series examining what a Windows script is, how it works, and how you can put it to daily use.

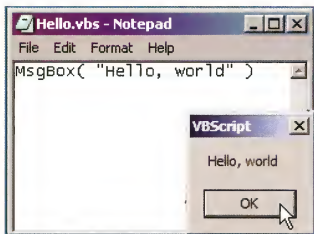
A BIT ABOUT BATCH FILES

In the days of DOS and Windows 3.x, there were two basic ways to automate PC procedures for execution with a quick key press. DOS used the batch file, of course, with line after line of simple commands. Windows 3.x introduced the Macro Recorder, which allowed you to record mouse movements and key strokes. The batch file was a favourite of DOS die-hards because it put a lot of power into their hands, but as the GUI environment of Windows took off, Microsoft became less enamoured of command-line tools and shunted the batch language from centre stage. The Macro Recorder was never a true replacement for batch files, and it too vanished, creating a space for a slew of third-party scripting technologies to step in. Yet none of these ruled the roost the way batch files once did.

With the arrival of Windows 2000, Microsoft rolled out a new approach to command-line control: the Windows Scripting technology. In theory, WS makes every part of the system accessible through a common scripting language derived from Visual Basic (VBScript) as well as Microsoft's Java-derived JScript. You can use either of these languages to create Windows scripts.

Using VBScript or JScript as your language of choice is really a matter of personal preference and familiarity. As they share similar commands, most of the differences come down to syntax.

VBScript shares the Visual Basic syntax along with many commands, so people who've already gotten their feet wet with VB will find VBScript a snap. For neophytes, VBScript is a solid foundation for learning the basics of programming before graduating to a more sophisticated language (such as C++ or the full-blown Visual Basic). On the other hand, JScript will come more naturally for Java junkies. For the sake of this article, we'll concentrate on VBScript.



Input and output: all it takes is one line of Windows Script to produce this dialog box.

INSIDE WINDOWS SCRIPTS

Windows scripts are stored as simple text files, and can easily be created and edited with Notepad. If you're doing more ambitious programming you may prefer a proper code editor — there are many third-party tools available, such as EasyEdit, which is included on this month's cover CD set.

When a script is run, it's compiled into an executable but is translated into bytecode — a sort of "halfway house" code from the original source code that's faster for the machine to read — and then interpreted at runtime.

The result isn't as fast as an executable file, but for most of what scripting is used for, the speed won't be a huge issue, and on a sufficiently fast machine you won't notice much lag.

The actual interpretation of the script is performed by an executable tool called the Windows Script Host (which is where the scripts' WSH extension comes from). This actually exists in two flavours: WSCRIPT, which runs directly in Windows; and CSCRIPT, which runs only non-interactive scripts direct from the command line. So if you're running a script that fires up dialog boxes or other user-interactive elements, use WSCRIPT; but if your script takes no input and reports nothing back, use CSCRIPT.

You can change which engine is used by default by using the /H switch (see "WSCRIPT/CSCRIPT command-line parameters", page 118).

If you open a command console and type WSCRIPT by itself, or run WSCRIPT from the Run box in the Start button, you'll be presented with two options: "Stop script after specified number of seconds" can be used to keep scripts from running in perpetuity; and "Display logo when script executed in command console" allows you to see when a script is being run using CSCRIPT (normally there's no visual feedback).

EasyEdit: an editor designed to handle code rather than simple text. This is a must for the more ambitious coders.

YOUR FIRST SCRIPT

The best way to learn about Windows scripts is to start working with them. To use scripting, you'll need a PC running Windows 98 or higher (including Windows 2000, Windows XP Home or Pro editions, or Windows 2003 Server). The Windows Script Host is bundled with all of these operating systems bar Windows 9x. Make sure you have the most recent version of the Windows Script Host before you start writing a script.

Version 5.1 of the Windows Script engine (that shipped with Windows 2000) contained a number of bugs which have since been fixed through service packs and standalone downloads. The most recent version of Windows Script Host is 5.6, and you can download it from the Microsoft library (www.microsoft.com/scripting). This site is also a great place for digging up further information on Windows scripting, although it can be rather daunting for novices.

In the tradition of programming tutorials since time immemorial, we'll begin with a simple script to produce a "Hello, world" message.

Open Notepad and type in the following text:

```
MsgBox("Hello, world")
```

Now save the file on the Desktop as "hello.vbs".

That's all there is to this script: a single line which tells Windows to draw a message box containing the specified text. Things just don't get any simpler... in fact, playing Solitaire is rocket science compared to this.

When you double-click the hello.vbs file, a message box with an "OK" button and the caption "Hello, world" should pop up.

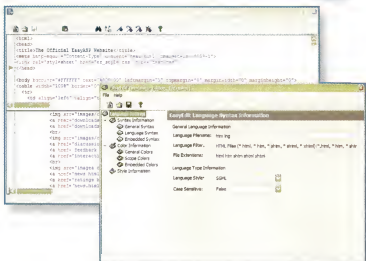
So what's going on here? `MsgBox` is a command object — one of many objects which WSH (and VBScript) use to perform actions. `MsgBox` pops up a message box with the text "Hello, world" passed to it as a parameter. Almost all commands require one or more parameters. In the case of the `MsgBox` command, Windows needs to know what text is displayed in the message box.

STARTING WITH SYNTAX

There are many "core" objects for WSH built into Windows, and these handle a great many actions. Almost all of the important things you would do in a script are accomplished through these pre-defined objects, although you can also use objects provided by a third-party designer or even create your own.

A full description of Windows' built-in objects and their parameters can be found in the online documentation for Windows Script Host — go to the Web site mentioned above and click on Windows Script Host Documentation. It's a good idea to poke around at all the commands referenced in these articles for full details on how they work.

To use a particular object, you have to create an instance for it, that is, assign it to a user-created object that can hold the results of the object's behaviour. Why access an object this way? Because if



you want to access multiple instances of an object in different ways — such as opening several different files at once, each of which need a different file object — you need to have different instances to deal with each object's instance discretely.

The WScript object is the single most important object in Windows Script Host. WScript allows a script to create instances of objects that are used in a script, and provides access to data about a script: its name, any command-line parameters passed to it, and so on.

To create an instance of the WshShell object (which lets the user work directly with the Windows interface), enter:

```
Set WshShell = WScript.CreateObject("WScript.Shell")
```

The `Set` command lets you take a user-created object and make it into a repository for data derived from an object.

So if WScript is an object, what's `WScript.CreateObject`? `CreateObject` is a method — one of the commands that the WScript object can be instructed to do. Methods are used in conjunction with an object by simply adding a full stop (.) after the object name and appending the method name. In this case, the script is saying, Use `CreateObject` to create an instance of the `WScript.Shell` object, and set `WshShell` to hold that object.

Having created an instance of an object, you can invoke that object's properties and methods. Methods are routines or command actions that an object can perform, while properties are data or statistics that the object can provide you with. For instance, one of the properties of `WshShell` might be `CurrentDirectory`, which returns

VBScripts and security

VBScripts have gotten something of a bad reputation, no thanks to the security holes in Microsoft Outlook. One common way to sabotage someone else's machine was to send a VBScript file in an email, which would run when opened, and cause all kinds of mayhem. Because of this, many people only think of VBScript as something dangerous and to be constrained, instead of as a powerful tool that can make things easier for PC users. If you're worried about security, the best thing to do is to upgrade to the latest service pack for your version of Windows, and get the latest version of the Windows Script Host.

the directory that the script is currently running in. To report this information back to the user, you could enter:

```
Set WshShell = WScript.CreateObject("WScript.Shell")
MsgBox WshShell.CurrentDirectory
```

You could also assign `WshShell.CurrentDirectory` to a variable and manipulate it from there. (Some properties can be set by the user and some can't; it depends on the object in question.) Variables are objects which can be set to arbitrary values, whether numbers or strings of text. When processing data, such as user input or information read in from a file on disk, the results are held in variables and can be manipulated freely.

Once finished with an object, it should be destroyed. This is especially important for scripts that repeatedly open and close a lot of objects, because the script's actions chew up a large amount of memory. The way this is done is by using the syntax `Set <objectname>=Nothing`. This tells the scripting host to dispose of the memory used by the object and return that memory to the system at large. While the script host generally returns all used memory to the system when the script finishes executing, don't count on it if you're using a complex script with a lot of objects.

As with any language, picking up the correct form of programming-speak can take some getting used to. Thankfully Windows is very forgiving — if the scripting host sees an error, it logs in its tracks and kindly, if somewhat cryptically, shares the error with you.

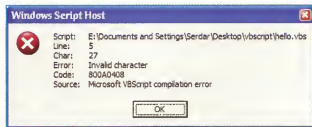
A FEW COOL SCRIPTS

One of the most common and practical things you can do with a script is send commands directly to the Windows interface. This is a great way to perform repetitive tasks which require several mouse movements or keystrokes.

For instance, here's a script that puts your PC into standby mode.

```
Set WshShell = WScript.CreateObject("WScript.Shell")
WshShell.SendKeys "^[ESC]"
WScript.Sleep 10
WshShell.SendKeys "us"
```

Save this file as "standby.vbs", then create a shortcut to it on your desktop or the Quick Launch toolbar — you might even want to



Error check: a syntax error in a Windows script, as flagged by the script host. Unless you specify otherwise, the script engine will always report back any script errors and stop execution.

WSCRIPT/CSCRIPT command-line parameters

WSCRIPT and CSCRIPT use several command-line parameters to control the way scripts execute. Some require explanation:

/B: Run scripts in batch mode. This suppresses all script errors and prompts, including `MsgBox` and dialog box prompts.

/D: Enable Active Debugging. This launches the Microsoft Script Debugger (if you have it installed) in the event that your script encounters a runtime error.

/E:<engine>: Use the defined engine to execute the script (VBScript or JScript).

/H: Change the default scripting host. This can be either `CScript` or `WScript`; the default is `WScript`, which runs scripts interactively.

/I: Interactive mode; the opposite of `/B`.

/JOB:<jobname>: Runs a WSF job. A WSF file can contain several scripts, each delineated by specific tags. WSF files will be covered in future instalments of this series.

/LOGO / /NOLOGO: Display or hide the banner for the Windows Script Host at runtime.

/S: Save the current command-line options for the current user, so that future `WScript` executions will use these same options.

/T:<timeout>: Time, in seconds, that a script is allowed to run before it's automatically terminated.

/U: Use Unicode for redirected I/O from the console (for `CSCRIPT` only).

/X: Run the script in the script debugger. If the debugger isn't launched, this will launch it.

change the icon from the default "script" glyph to something a little more appropriate. Now you can forget about working your way through the Start > Shut Down menu. Just click this icon and Windows does the work for you. You can even assign an access key to the script by editing the Shortcut key property.

This script includes one of the most powerful methods of `WScript.Shell`: the `SendKeys` method. `SendKeys` allows a script to send keystrokes to the system just as if you were typing them. These keystrokes are interpreted directly by the system, or by a Windows application, and are supplied in a special syntax. The `^` character indicates that the `Ctrl` key is being pressed in conjunction with the next key, and a key name in curly braces indicates a special key — in this case, the `ESC` key.

You can find a full list of the `SendKeys` commands in Microsoft's Windows Script Host reference document

Shutdown properties: save yourself the trip to the Start menu.

(<http://msdn.microsoft.com/library/default.asp?url=/library/en-us/script56/html/wsmthsendkeys.asp>).

The **Sleep** method is another useful WScript.Shell property. Sleep causes the script to simply wait around and do nothing for x milliseconds (in the Standby script, 10 milliseconds is used). It's often a good idea to provide a Sleep action after a set of keystrokes so that the system can catch up. What may take only a fraction of a second now might take a lot longer if the script runs concurrently with other programs.

Breaking the script down into four lines, it starts by setting the object and the associated method, and getting it ready to accept data. The script then sends the Ctrl+Esc keystroke, which brings up the Start button menu. This is followed by a 10ms pause in case the PC needs time to catch up. Finally, the keystrokes U and S are sent. These are the keyboard commands for calling the Start menu's Shut Down option (in some versions of Windows this is called "Turn Off Computer", although the same keystroke applies) and selecting Standby.

One key tenet of programming is that code can, and should, be reused wherever possible. A script like this, with some minor tweaks, can be reused to create scripts that perform other functions. Here are some examples:

```
Set WshShell = WScript.CreateObject("WScript.Shell")
WshShell.SendKeys "^ESC"
WScript.Sleep 10
WshShell.SendKeys "u+h"
```

Save the file as "hibernate.vbs" and you'll be able to send your desktop or notebook into the land of nod with a click (assuming that you've got Hibernate enabled — through Control Panel > Display > Screensaver > Power menu). Yet the only difference between hibernate.vbs and standby.vbs is the second **WshShell.SendKeys** line: this sends u+h instead of us. The + symbol is used to trigger the Shift key, which reveals the Hibernate option in case it's hidden, as is the case with some machines; if Hibernate is already enabled the Shift keystroke doesn't make a difference. As before, create a desktop or Quick Launch shortcut to the script — you'll even find a suitable "sleepy PC" icon in the SHELL32.dll library.

Take the same script and change the last line to **WshShell.SendKeys "uu"**, and your PC will be turned off completely. For a script that will automatically restart Windows, modify **WshShell.SendKeys** to send "ur".

Another system object is **WScript.Network**, which lets you set or retrieve network settings. One of the methods that **WScript.Network** has is **MapNetworkDrive**, which lets you assign a UNC share to a logical drive:

```
Set WshNetwork = WScript.CreateObject("WScript.Network")
WshNetwork.MapNetworkDrive "E:", "\\MyComputer\MyShare"
```

SUBROUTINES AND FUNCTIONS

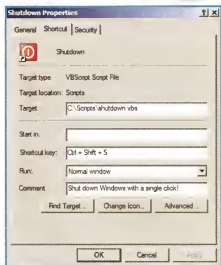
Two very powerful features of Windows Script are the abilities to create subroutines and functions within a script. Subroutines and functions provide ways of taking pieces of code and reusing them.

If you're constantly repeating the same tasks in a script, or if you need to duplicate something, the best way to handle it is by making that code into a subroutine or function.

Here's a simple example of an object in a script — a user-created subroutine that takes a string of text and prints the leftmost five characters to a message box:

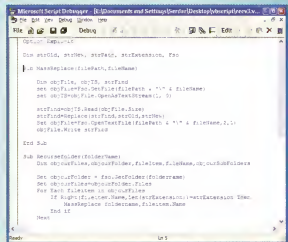
```
Sub LeftBox(strInput)
strOutput=Left(strInput,5)
MsgBox(strOutput)
End Sub
```

Left Sub "This is a test"



Buggin' out

One of the optional components to load with Windows is the Microsoft Script Debugger, an interactive editor and debugging environment that lets you step through code line by line and determine where specific problems arise. You can also set breakpoints and inspect variables as they are assigned. If you're planning on being ambitious with scripts, you should install Microsoft Windows Script Debugger from this address: <http://msdn.microsoft.com/library/default.asp?url=/downloads/list/webdev.asp>.



► **Powerful debugging:** the Windows Script debugger lets you work interactively with scripts to zero in on errors.

The section of the script between `Sub` and `End Sub` is set off from the script at large; it lists the code that's to be run as the `LeftBox` routine. It's not executed until the last line of the script itself, where `LeftBox` is invoked as a command.

Note that `LeftBox` is only available in this script; it's not available to other scripts unless they include the `LeftBox` subroutine. Subroutines can be put anywhere in the body of a script, but it's good form to place them at the top where they can be found a little more easily.

When you define a subroutine, you give it a name (here, `LeftBox`) and a list of parameters. `strInput` is the only parameter passed to the subroutine; in this case, it gets passed the string "This is a test". Depending on the subroutine, you can pass one or more parameters (or even none).

The first line of the subroutine uses the `Left` function, a routine that's built into VBScript. `Left` takes any string and returns the leftmost `x` characters. In this case, it's taking `strInput` (the first parameter passed to `Left`) and returning the leftmost five characters (the second parameter). A variable named `strOutput` is used to hold the results, and is set to equal the results of the `Left` function.

Finally, `strOutput` is used as a parameter in `MsgBox` to display the results. The message box should simply read "This", but the string in the script can be set to anything you like — feel free to experiment with different strings to see what happens. (Strings are always enclosed in quotes.)


Since `Left` is a function, what's the difference between a subroutine and a function? A subroutine is invoked like a command; in the previous example we ran the `LeftBox` subroutine by simply

entering `LeftBox("string")`. A function, on the other hand, is invoked through a variable, which holds the result of the function. Note that when you call a function, its parameters are enclosed in parentheses; a subroutine's parameters are not. For instance, to rewrite `LeftBox` as a function that returned the leftmost five letters of a string to a variable, the script might look something like this:

```
Function LeftBox(strInput)
LeftBox=Left(strInput,5)
End Function
```

```
strTestIn="This is a test"
strTestOut=LeftBox(strTestIn)
MsgBox(strTestOut)
```

Here, `LeftBox` takes the string `strTestIn` and returns the result into the variable `strTestOut`. Sometimes this way of processing variables is a lot more useful than a subroutine. A good rule of thumb for using subroutines rather than functions is this:

- Use a function when you need to return a result or answer to the program at large.
- Use a subroutine when you don't. 

Next month

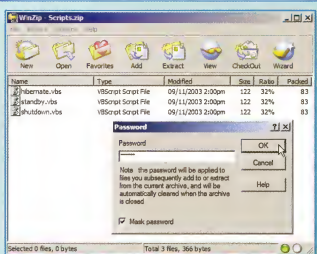
Putting Windows Scripting to work on more advanced tasks, such as working with the file system. Plus, clever time-saving programming tricks.

Scripts and security

The attributes that make scripting so powerful can also turn them into a dangerous weapon in the hands of hackers and mischief-minded script kiddies. Many viruses or worms send emails containing script code to take advantage of security holes in Windows, such as the `ILOVEYOU` virus. That's the reason why recent versions of the Outlook email client block script actions by default. On top of that, antivirus programs now treat scripts as possible offenders. Unfortunately, this also means that if you try to swap legitimate scripts with friends or co-workers, it may be blocked by their email or antivirus software. The mere presence of script code, whether or not it's malicious, is often enough to send the gates slamming down.

That's great if you're on the receiving end of a malicious script assault, and to protect your system you should ensure you're running the latest Service Pack for your version of Windows, as well as the latest version of the Windows Script Host.

But what if you want to email someone a time-saving script? Packing it in a plain Zip file used to work, until antivirus software got smart enough to look inside archives. But AV sentries usually can't see inside a Zip that's been password-protected, so use an archive tool like WinZip to wrap a password around the archive. When you create a new Zip file from a script, or drag the script into an empty Zip file, click WinZip's Password button at the bottom of the Add dialog



► **Beat the blockade:** a password-protected Zip file lets you share scripts via email without them being intercepted by antivirus software or stopped by Outlook.

box. Or set a password for an existing Zip file through the Options > Password menu. Just be sure to let the recipient know what the password is.

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Surviving the update maze

Serdar Yegulalp sorts through the mess of Windows service packs, patches, hotfixes and roll-ups to help bring your PC up to date once and for all.

It seems like hardly a week goes by without a new fix being pushed out by Bill Gates' merry band of code-monkeys. Even if they have your best interests at heart, the sheer proliferation of updates, served up under multiple names and forms, is enough to make your head spin. As tempting as it is to ignore each new fix, you could be leaving your PC vulnerable to attack. Microsoft promises that things will improve with the arrival of Longhorn, thanks to revisions to the core OS update engine, but why should you wait until 2006 to put an end to the confusion?

To stay on top, you need to set ground rules. Not every fix will be relevant to your situation, so don't download and install everything you see. There are different strategies for patching your system, depending on whether it's a clean install or an existing setup. So it all comes down to knowing what you need.

Patches are released on an as-needed basis, usually to address issues with security or compatibility.

Every so often, the number of accumulated fixes will grow to a point where it makes more sense to bundle them all together as one mega-download — this is where a service pack comes in. Service packs are usually (but not always) collective, containing fixes for previous SP releases. An exception to this rule is Office XP, where you need to apply both SP1 and SP2 separately.

A hotfix is Microsoft-speak for a patch released between service packs — usually a fix for a single problem. You should only download a hotfix when it's necessary to sort out a particular problem.



Name, rank and serial number: before you start that mammoth download session, check if your PC is already running a service pack.

A rollup (also known as a "security rollout") aggregates several related hotfixes and patches, or a group of hotfixes that may eclipse each other, into a single post-SP download (although subsequent service packs would include the rollup). The first of these for Windows XP (Update Rollup 1) was released in October and includes 22 previously released fixes.

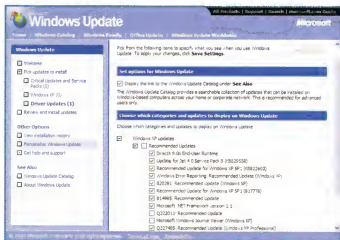
AT YOUR SERVICE

The big guns of the update world are service packs. They're generally a must-have, especially if you haven't been applying patch updates. Service packs are typically the first update you apply to a new machine or a system in need of a refresh or rebuild.

Freshening up a new PC can actually pose more of a challenge than patching an existing computer. This is because it could be running the original RTM (released to manufacturing) build of Windows, with no upgrades or patches applied. The first time you launch Windows Update on such a machine, expert scores of patches to be reported, all waiting to be downloaded and installed. This process can take hours and is best avoided where possible.

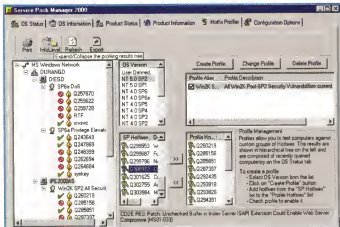
To install a service pack, determine what build of Windows your PC is really running. Builds are variants of the OS version number, with each system going through a series of builds during the alpha and beta development cycle. The last few builds are considered "release candidates" until one of them is given the sign-off to become the gold code that's released to manufacturers. A little-known trick that helps here is *winner*, which is a graphical equivalent of the old DOS *ver* command. Hit Start > Run and type *winner*. An About Windows screen should pop up with the details on your current OS. A clean "build number" of 2600 indicates that you're running an original RTM edition of Windows XP; the Windows 2000 equivalent is build 2195. If you're lucky, the screen will also report which service pack is installed.

If you're curious about the "version 5.1" line, that's the official number stamped onto the Windows XP operating system. While Microsoft's marketing boffins came up with monikers like Windows 95, 2000 and XP, the code-cutters stuck with a conventional numbering scheme that follows on from Windows 3.x.



No self service: We'd gladly include the service packs on our cover CD set, if only Microsoft would let us...

Patch panel: Groovy Storm's Service Pack Manager 2000 does a superb job of applying and managing patches for Windows as well as other Microsoft products.



So the Windows 9x family is actually part of the Windows 4.x generation; Windows 2000 is revealed as Windows version 5.0, and Windows XP is version 5.1. Longhorn already identifies itself as Windows version 6.0.

If you're dealing with an RTM machine, applying XP Service Pack 1 is the first item on the checklist. SP1 comes in two flavours, Service Pack 1 and 1a, the only difference between the two being that 1a doesn't include Microsoft's Virtual Machine for Java. This is because VM was discontinued after SP1's release. If you need a VM, you can grab one from Sun Microsystems (www.sun.com.au).

Service Pack 1 is available for download from www.microsoft.com/WindowsXP/pro/downloads/servicepacks/sp1. It doesn't matter if you're running Windows XP Home or Professional edition, as the SP automatically determines the appropriate files for your version of the OS.

Microsoft offers two versions of the downloadable SP1. The Express Installation is a tiny 2MB program that checks your current setup and then jumps online to download the components required for your specific system. Microsoft claims that the typical download is around 30MB. This method keeps online sessions and download times to a minimum, but means that whenever you reinstall the SP on your machine or any other PC, it'll follow the same routine.

If you have a broadband or LAN connection, the best option is to download the full 134MB self-contained SP1, which is called the Network Installation. Once downloaded, you can put it on a network drive or a CD and update any XP machine, even if it doesn't have an Internet connection.

If you're on a dialup connection or don't have Net access at all, you can buy a copy of SP1 on CD directly from Microsoft. Another alternative is using a friend's high-speed Internet connection and going to the Windows Update site (www.windowsupdate.com), which lets you select and download updates without using the automated process of the Windows Update service. Once you've got what you want, copy it to a CD or onto an external hard drive, then you're set to go.

After you've downloaded SP1, you can "slipstream" it onto new machines without going through separate installation routines. This involves patching the original RTM files from the Windows XP CD with the updated files from SP1 (you'll need the complete Network Installation version). The result is a custom-burned CD which puts the most up-to-date core OS onto any new PC — much more efficient than installing the OS and service pack separately. With a bit of extra work you can even make the CD bootable, just like the regular XP disc.

There's a tutorial on the whole process at www.windows-help.net/WindowsXP/winxp-sp1-booted.html, with links to details on adding the Windows XP Rollup 1 hotfix to the set. Windows 2000 users can find instructions for slipstreaming their favourite OS (which now has a total of four service packs to cope with) at <http://old.bink.nu/bootcd>.

TAMING WINDOWS UPDATE

Once you've brought a system up to speed, you need to consider where you're going to keep it up to date. This usually involves the Windows Update service, but there are some other features of this tool that can save you considerable hassle.

The operation of the Windows Update service is mostly automatic, but if you're dealing with a machine that's either

Making it work

Dealing with Windows Update can be aggravating enough on its own, but what's worse is when it simply refuses to work and throws back an unhelpful "undefined error" message with the code 0x800A138F. Here are the most common causes for an update hang-up.

Anti-spyware products are blocking Akamai-based IP addresses

The Akamai server network hosts both Windows Update files and some ads that are often stopped by ad-blocking software. If you use an ad-stopper, set it to allow files from Akamai networks before you start an update session.

Firewalls or other network problems are blocking SSL port 443

Windows Update uses SSL, so make sure that SSL connections are working.

IE's temp file cache is overloaded

IE's temporary file cache shouldn't be set too high; try cleaning it out.

Wrong system time

The computer clock is needed to verify that the certificates used to sign Windows components are valid. Make sure your clock is set correctly.

Critical Internet Explorer DLLs are not registered

Sometimes several key IE components can become unregistered and cause IE to misbehave, which does no favours for the browser-based Update service. To fix this, open a command prompt and type each of the following lines (hit Enter at the end of each one):

```
regsvr32 urlmon.dll
regsvr32 shdocvw.dll
regsvr32 mshtml.dll
regsvr32 browseui.dll
```

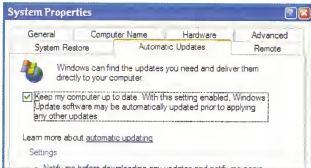
Then reboot and try Windows Update again.

Critical care: XP's Automatic Updates will download only the most crucial fixes, but when used in conjunction with Software Update Services can fetch many other patches as well.

unpatched or woefully behind in updates, you may not have any idea where to start.

Windows Update automatically flags certain updates as essential — these are the so-called “critical” updates. Some of these must be installed independently of everything else, and will be flagged as such. Even if you select every update on the page, you'll only be able to download and install one critical update at a time. Service Pack 1 and the DirectX updates are examples of this.

With the essentials out of the way, you can check out what else is suggested, starting with the list of recommended updates. You can happily go without things like Windows Movie Maker 2, although Windows Update recommends it every time you use the service. To stop it from being suggested, click on Personalize Windows Update in the left-hand pane and you'll see a list of all currently available updates with checkboxes next to them. Uncheck the ones you don't want to see again, then click Save Settings. This even works for device drivers, which is important if you download bleeding-edge drivers from the manufacturers. Windows Update



displays the publication date of any driver to be installed, so you can check that against what you already have.

If you're adding an update of DirectX, make sure you have the latest drivers for your hardware before you install it. Loading new drivers for existing hardware after updating DirectX can have unpredictable effects.

The reverse applies for Windows Media Player, which hooks into many DirectX technologies: get the latest build of DirectX first, and then install the latest version of WMP.

Updates for Internet Explorer and related technologies should also be among the first things you patch, due to the number of other components that depend on them. The general rule is this: the more core the technology, the earlier in the patch process it should be updated.

If you're constantly being prodded to download patches for software you don't use, odds are it'll simply be rolled into the next service pack. If it's something you're not using, but it's contingent on something else, it will usually be consolidated into another patch anyway.

Service packs and the APC cover CDs

Some of the most-requested items for APC's cover CD set are the service packs for Windows XP, 2000 and 9x (along with Office 2000 and XP). So why don't we include them? Because Microsoft won't let us (apart from a one-off instance, when APC — along with several other Australian computer magazines — was permitted to include the Windows XP Service Pack 1 on our CD).

We can't figure it out. Microsoft is eager to cite their OS updates, especially when they plug security holes. And they say that we should all be running the latest updates, not just for the sake of security but to enjoy a richer and fuller Windows experience. That's fair enough, but try telling that to dialup users or administrators with a number of non-networked Windows PCs to update. It's no wonder that so many Windows users remain vulnerable to hack attacks.

Microsoft's local office reckons they're on our side but are stymied by the execs back at Redmond, where it all seems to bounce around in legal never-never land because they're not used to magazines with CDs on the cover. Nonetheless, APC continues to plug away, trying to make our case heard and hoping to turn the tide.

AUTO-PILOT

Windows XP's Automatic Updates feature can be used to take some, but not all, of the burden out of your hands. It scans Windows Update periodically for critical updates, and can download and install them as needed. It's important to note that critical updates aren't the only ones available, and an update that's crucial to you may not be considered so by Microsoft — it'll instead appear as a “standard” patch, so Windows Update has to be manually run to obtain it.

If you want Windows Update to deliver more than just the minimum fixes, try Software Update Services. This free Microsoft service is designed for systems administrators and lets you choose all the updates to roll out to users, including ones that aren't provided by default. Find out more about it from www.microsoft.com/windowsserver/system/sus.

There are also third-party patch-management solutions such as Gravity Storm Software's excellent Service Pack Manager 2000 (www.securitybastion.com), which patches Microsoft OSes and other Microsoft products such as SQL Server. □□□

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Getting the most from **C++BuilderX**

Follow along with the free version on the cover CD as David Williams takes C++ BuilderX for a spin.

Looking for the sharpest IDE on the block? C++ BuilderX shreds development time by putting smart wizards and templates at your fingertips. Add class browsing and stylish source code history, and you've got a tool to transform any novice code cutter into Edward Scissorhands.

A CLASS ACT

While the C++ language is deliberately minimalist, its class libraries — which provide a wealth of functionality — are buried in a maze of complex files and cryptic directory hierarchies. For years, programmers have trawled through header files for definitions of abstract data types, listing the number and type of fields. Now that's all in the past.

C++ BuilderX's class browser reduces all that effort to a few mouse clicks. The browser is switched off by default, but that's easily fixed.

The topmost window in C++ BuilderX's left-hand pane shows the files in the current project. It also displays tabs to switch to a Windows Explorer-style view or to the class browser. Click the latter and a message appears stating "Class browsing is disabled for active project". Turn it on — after all, that's what you're here for.

To activate the browser, right-click on the message and select Properties (alternatively, click Project > Project Properties, then choose the Class Browsing tab). Check the "Enable C++ Class Browsing" box. Here you'll find a bevy of options for sorting and grouping output, all of which impact performance. While we didn't experience noticeable delays while working with class browsing enabled on a 2GHz Pentium 4 machine, this might be

different on Borland's minimum recommended platform of a 500MHz Pentium III.

To meaningfully sort a class list, turn on "Sort alphabetically". For instance, find the `sockaddr_in` data structure. This is used in network programming to represent an endpoint address of a socket. Click the "+" beside `sockaddr_in` to view its elements.

And now for something really cool — right-click on the `sin_addr` item, then select "Go to Declaration" from the pop-up menu. C++ BuilderX opens the header file containing the declaration (in this case, `winsock.h`) with the following program code:

```
/*
 * Socket address, internet style.
 */
struct sockaddr_in {
    short sin_family;
    u_short sin_port;
    struct in_addr sin_addr;
    char sin_zero[8];
};
```

Note that while three of the fields are basic data types (for example, `sin_family` is represented as a `short` integer), `sin_addr` is a structure of type `in_addr`. Jump to `in_addr` by clicking on the class-browser window and typing `in`. Right-click and select Go To Declaration to view the definition of an Internet address; as with all Internet addresses, this is four bytes.

As you can see, class browser offers a wealth of ways to help you understand and decipher C++ libraries.

RETURNING TO THE SOURCE

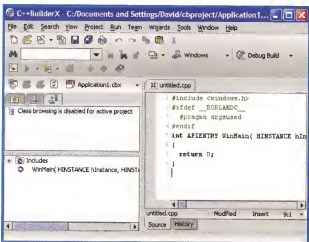
Ever added a new feature to smoothly running code, then watched it all fall apart? All programmers know that sinking feeling, and for most the first questions are: Just how much was changed? Can the old code be restored?

The answer is now "yes" with C++ BuilderX's source-code history. Once the exclusive domain of version-control systems (including CVS and Visual SourceSafe), this is now built-in to the program.

Click the History tab at the bottom of the code window to view all revisions of a source code file and the differences between them. Select a revision to view its contents in the bottom half of the window.

C++ Builder's source code history really comes into its own on the Diff (difference) tab page. Here the variation between any two revisions can be seen at a glance. Lines of code that have been added appear as yellow "+" changes, while deleted lines are shown as red "-" changes. Logically, modified lines are displayed as + and - pairs. An option for "smart" difference checking causes C++ BuilderX to ignore changes to white space.

Programmers have long dreamed of such a facility; since the



Enable class browsing: by default, class browsing is disabled. Change this to access C++ Builder's full capabilities.

UNIX command-line diff tool, with its arcane output, through to WinDiff, a more graphical program that accompanied Visual Studio. In every case, though, these were external utilities. A diff tool within the editor is unprecedented — but it's the right way to go.

At times, copies of the source code will inadvertently branch along different paths. This happens when two programmers work independently on one piece of code. Ordinarily, you'd have to search manually through the file to identify every change. But C++BuilderX performs this chore effortlessly — with the intelligence to know the common base for both files.

To merge revisions, look to the Merge Conflicts tab on the History window. This is only enabled if conflicts are encountered. These, in turn, can only be detected if an external version-control system is used in addition to the built-in history — logically, a conflict can't happen on a single computer, as two people can't independently edit the same file from one disk.

When a conflict occurs, the Merge Conflicts page displays the workspace and repository sources side-by-side, with conflicting blocks of code or text highlighted. Radio buttons beside these blocks make it easy to select those you want to keep. The preview pane at the bottom of the page shows how the workspace file will look with the changes applied. To scroll between pairs of conflicts, use the navigation arrows at the bottom-left corner of the page.

By default, changes in the workspace will be retained; once you've selected these, click Apply to update the file in the edit buffer. However, be aware that applying changes doesn't save the file or check in (commit) changes to the repository, so using Undo too many times can actually restore the conflicts.

One caveat: historical information is based on previous revisions, which continue to exist as intact files. This means that the history is not stored as a database, or even within the file itself. Ordinarily, this isn't a burden — every time a file is saved, the IDE automatically creates a backup copy, retaining a total of 10 backups, after which the oldest is removed each time the file is saved.

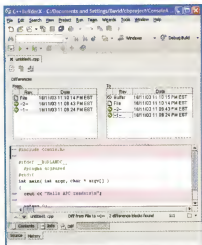
CODE TEMPLATES

If you're like most people, you hate typing recurring code templates. Luckily, C++BuilderX lets you speed up the programming process. Simply type the template name into the editor, press Ctrl+J and watch the template expand before your eyes.

The templates provided on installation largely cover constructs like if/else and try/catch. For instance, the pre-written "if/b" template provides an if/else block. To use it, type if/b, then press Ctrl + J. Lines of stub code appear, just waiting to be fleshed out:

```
if ( )
{
}
else {
}
```

Spot the difference: the history tab finds all differences between two versions of a file.



While a nice range of templates is supplied, you can add more through Tools > Editor Options. Using code templates certainly beats wearing out a path on your keyboard.

TO DO LIST

All programmers leave notes for themselves within their code: "must check this"; "possible memory leak here" and so on. These can be invaluable reminders at a later date — unless, as so often happens, they're impossible to find.

You'll never need to search for notes again, now that Borland has incorporated a to do list within the IDE. Simply type a comment line prefixed with **TODO**: into the source code. Instantly, C++BuilderX recognises that it has to track the line. A node is added to the structure window (located at the bottom of the left-hand pane) which displays To Do items. Click on an item to go straight to it, irrespective of the file it's in.

AT BREAKING POINT

The most useful debugging facility is the humble breakpoint: a line of code at which program execution pauses. While any credible development environment allows breakpoints to be set, the excellence of C++BuilderX's breakpoints deserve mention.

Breakpoints may be conditional or unconditional. When unconditional, program execution always pauses at the designated source code line.

To set a breakpoint, select a type from the Run > Add Breakpoint menu. That's all there is to unconditional breakpoints. For a conditional breakpoint, add a condition and/or a pass count. This is where the program really shines. By setting a condition, C++BuilderX evaluates criteria to decide whether or not to break. If the condition is true, execution will break. If you set a pass count, program execution will stop once the designated line has been reached the specified number of times. When these options are used together, execution will break once the line has been reached and the condition evaluated true for the nth time.

In addition, C++BuilderX can break when a particular variable is assigned a certain value, or a certain address of computer memory is accessed. In both cases, the unconditional and conditional options of line breakpoints also apply. Further, the program will allow a discrete range of actions to be performed. This may be to log a message, enable or disable another group of breakpoints, or one of several other choices.

Debugging is such a necessary part of software development that understanding breakpoints can make the difference between a good programmer and a great one. And after all, why spend time wrestling with code when you can simply cut it? [ETTC](#)

Downsize your Web site

Don Sorcinelli explains how you can optimise Internet and intranet sites for viewing on Pocket PC handhelds.

With both handhelds and hotspots growing in popularity, Web developers want to know the best way to deliver data to users on the go. Not only do they need to reach corporate users and enthusiasts, but also employees who use handhelds in warehouses, stock rooms, or anywhere else where enterprise information needs to be on tap.

While data-to-go is a far less complex operation than it seems, it does require a shift in thinking. Multimedia plug-ins and animation effects are the stuff of desktop browsers, while handhelds don't even have the processing power of a Celeron.

Many developers lose sight of a basic fact: all Web browsers will render HTML pages. Beyond that, the differences between browsers and their platforms come down to what each can or can't render effectively. So, if you're developing for the Pocket PC, you need to understand its limitations and capabilities.

A SLICE OF PIE

The standard Pocket PC browser is Microsoft's Pocket Internet Explorer (PIE), and while there are other browsers available, it makes sense to stick with PIE. It's free, fairly competent and every Pocket PC has it.

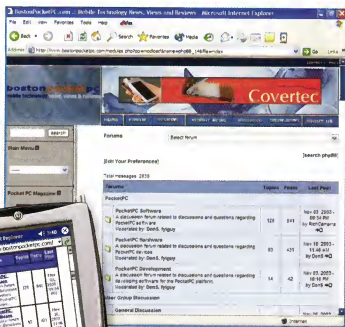
That said, PIE has undergone several incarnations since its debut in Pocket PC 2000. To be compatible with all versions of PIE, you'll need to settle on Pocket PC 2000 as the baseline. This means you'll have full support for HTML 3.2 tags, but only a limited set of JScript commands, and no Cascading Style Sheets.

Of course, if your company has settled on a single model of handheld as fleet issue, such as those running Pocket PC 2002 or Windows Mobile 2003, you could write specifically for features supported in these versions. Note that the browser in Windows Mobile 2003 supports HTML 4.0, JScript 1.5 and CSS.

While the thought of being restricted to HTML 3.2 would send many Web developers into a panic, it is entirely possible to create an attractive and highly functional site using nothing but HTML 3.2. It's almost a refreshing challenge to get back to basics. So, what's the key to creating handheld-friendly HTML?

SIZE MATTERS

Your first inclination when developing Pocket PC pages might be to squeeze a standard Web page down to handheld size, without changing the underlying HTML. Although this is sometimes possible, it's rarely the best course of action as the existing Web page may employ HTML elements not supported by PIE 2000. That's why



Cross-platform soul: while this page looks different on the desktop and handheld, it has the same content and functionality on both.

it's best to start designing your PIE pages with a clean slate.

From a Web-page perspective, the greatest difference between a handheld browser and a desktop or notebook browser is the screen size, and therefore the available viewing area. At its smallest a desktop browser offers 640 x 480 pixels, while a Pocket PC is limited to half that resolution (240 x 320 pixels) and a screen that's turned sideways.

You'll also need to allow for window elements such as borders and scroll bars, which occupy a proportionally larger slice of screen space than on a desktop browser. For instance, a vertical scroll bar takes up approximately 12 pixels, and application borders use between one and two pixels. A good rule of thumb for designing Pocket PC Web pages is to set your maximum width as 220 pixels.

TABLE MANNERS

The most common complaint Web-browsing Pocket PC users have is that they spend too much time scrolling from side to side to read content. While using 220 pixels as a maximum width corrects this, there's an easier way to control it. Simple enclose your Web page content within an HTML table.

To do this, use the TABLE element as follows:

```
<TABLE WIDTH="220">
</TABLE>
```

► **Browsing without borders:** while this site uses tables for layout, it applies the `BORDER=0` attribute to conceal table borders from the viewer.

When planning your site's layout, don't forget to allow for the size of borders between table columns. Each border will cost at least one pixel (based on the `TABLE` element default), so the total number of pixels used will be the number of columns in the table, plus one extra pixel, multiplied by the number of pixels per border. For example, a table with five columns, six pixels will be used for the borders. While this may not seem like much, remember that you only have 220 pixels to work with.

To remove table borders, modify the initial `TABLE` tag as follows:

```
<TABLE WIDTH="220" BORDER="0">
```

Your table should also allow for some "cell padding" to ensure that content from one column doesn't run into the next — this is particularly important if you're not using borders. Set at least one pixel as padding between the cell content and cell border. To do this, add the following attribute to the `TABLE` tag:

```
<TABLE WIDTH="220" BORDER="0" CELLPADDING="1">
```

To calculate the number of pixels required for cell padding, multiply the number of columns in the table by double the amount of cell padding — you need twice as much because cell padding applies to both sides of a cell.

This means a five-column table with one pixel of cell padding per column requires 10 pixels for cell padding ($5 \times (2 \times 1)$).

In this scenario, the page already needs six pixels for borders and 10 pixels for padding, leaving only 204 pixels for content (spread across five table columns). As you can see, it's vital to experiment with layout to get the best mix of appearance, functionality and content.

The table row (`TR`) and table cell (`TD`) elements basically fall along the same lines as those of standard browsers. You can, for example, use fixed sizes (in pixels) for cell widths, with the following code:

```
<TABLE WIDTH="220" BORDER="0" CELLPADDING="1">
<TR>
<TD WIDTH="99">Some content</TD>
<TD WIDTH="75">More content</TD>
<TD WIDTH="30">Even more content</TD>
</TR>
</TABLE>
```

You could also apply relative sizing to cell widths:

```
<TABLE WIDTH="220" BORDER="0" CELLPADDING="1">
<TR>
<TD WIDTH="50%">Some content</TD>
<TD WIDTH="30%">More content</TD>
```

```
<TD
WIDTH="20%">Even
more content</TD>
</TR>
</TABLE>
```

Regardless of which method you choose, thoroughly test your finished HTML pages on PIE.

Don't rely on your desktop browser, which may be more forgiving of code errors. For example, Internet Explorer will often "fill in" missing



Sniffing the PIE

For Web developers using server-side scripting languages like ASP, ASP.NET, PHP or Perl, everything here still applies — it's only the context that's changed. The combination of proper HTML coding and server-side scripting features such as database access and dynamic Web-page rendering can make for powerful PIE-ready Web applications.

For sites that must be read on both desktops and handhelds, "browser sniffing" — or browser-detection scripting — can help give applications the proper rendering. Below are some code samples of browser sniffing for PHP and ASP:

PHP

```
<instruction><?
$ua=$_SERVER["HTTP_USER_AGENT"];
// location should be set to the location of your
// Pocket IE code...
$location='pocketpc/index.php';
if (strpos($ua, "Windows CE"))
{
header("Location: $location");
exit;
}
?>
```

ASP

```
<instruction><%
'Check for Windows CE (Pocket PC, Palm-size PC, Handheld PC, Handheld
PC Pro)
if (InStr(Request.ServerVariables("HTTP_USER_AGENT"), "Windows CE"))
then
response.Redirect "pocketpc/index.asp"
end if
%>
```

closing tags (such as TABLE tags) and draw the table accurately, but PIE doesn't have this error-correction. The golden rule: test on the target platform.

FACES AND FONTS

Having come to grips with the layout of Pocket PC pages, it's time to get down to styling the content. Three factors determine the usability and readability of text online: size, clarity and flow.

While TABLE elements control text flow, the FONT element, with its associated FACE and SIZE attributes, is the key to mastering size and clarity.

Because the Pocket PC operating system ships with a limited set of fonts, play it safe by using Arial, Tahoma and Verdana. You can specify these through the FONT element's FACE attribute.

Use the SIZE attribute to lock text size, which on HTML pages can often be a matter of preference for designers and readers. A good starting point is to give standard text (body copy) a SIZE attribute of one, and larger text (headlines) a SIZE attribute of two.

You can always emphasise text using other HTML commands, such as bold, italics and the COLOR attribute.

Here's an example of how colour and font size might be employed:

```
<TABLE WIDTH="220" BORDER="0" CELLSPACING="1">
<TR>
<TD WIDTH="100%">
<B><FONT FACE="Arial, Tahoma, Verdana" SIZE="2" COLOR="BLUE">
My headline</FONT></B>
</TD>
</TR>
<TR>
<TD WIDTH="100%">
<FONT FACE="Tahoma" SIZE="1">This is the main body of the story.
</FONT>
</TD>
</TR>
</TABLE>
```

SIZING UP IMAGES

As Pocket PCs have limited screen space, images must be sized to ensure Web pages are both easy to read and to use. There are two ways to size images properly for viewing in PIE.

The first is to physically resize the image using a graphics tool. This is usually the most desirable method, as it shows you exactly what the user will see, and slashes download time by reducing image size.

The alternative is to alter the display size of the image using the WIDTH and/or acceptable HEIGHT attributes of the IMG element along the following lines:

```
<TABLE WIDTH="220" BORDER="0" CELLSPACING="1">
<TR>
<TD WIDTH="50%">
<IMG SRC="news.jpg" WIDTH="100">
</TD>
<TD WIDTH="50%">
<B><FONT FACE="Arial, Tahoma, Verdana" SIZE="2" COLOR="BLUE">
My headline</FONT></B>
</TD>
</TR>
<TR>
<TD WIDTH="50%">
<IMG SRC="mypic.jpg" WIDTH="100">
</TD>
<TD WIDTH="50%">
<FONT FACE="Tahoma" SIZE="1">This is the main body of the story.
</FONT>
</TD>
</TR>
</TABLE>
```

Take note that while this technique alters the dimensions of the image for display, it doesn't change the size of the image file. In fact, the image is downloaded at its original size, then rendered by PIE to the desired dimensions.

A final word of warning: don't forget to test all resized images on PIE for legibility. What's lush and lovely on a desktop browser at 640 x 480 may be squashed when it's shrunk to 200 x 150. [ENTER](#)



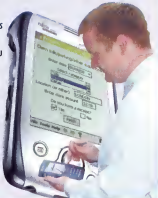
Mobilise your business with Pendulum for Pocket PC

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- ◆ stock control
- ◆ delivery tracking
- ◆ van sales
- ◆ asset tracking
- ◆ market research
- ◆ remote order taking

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- ◆ barcode input/data capture
- ◆ RF wireless comms capability**
- ◆ signature and drawing capture
- ◆ ODBC database linking**

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Mobile Data Technology Pty Ltd



Freeware filter frenzy

Who says you can't get something for nothing?

Trevor Morris has rounded up more than 50 of the finest Photoshop plug-ins — and they're all free!

When Adobe introduced the concept of third-party plug-ins for Photoshop in the early '90s, the company couldn't have had any idea of how successful they'd become. Today, plug-ins are the industry standard for graphics and video application extensions.

Plug-ins work their magic by providing additional functionality or capabilities to an application by, for example, including support for a proprietary file format, creating unique effects, taking advantage of new hardware, or automating repetitive tasks.

Over the years, hundreds of authors have produced thousands of Photoshop-compatible plug-ins. Although there are plenty of great commercial plug-ins (some of which are powerful and modestly-priced, while others are ridiculously expensive), the best place to start digging is through the freebies online.

To save you scouring the Web, downloading a stack of programs, then trying each one to see if it's worth keeping, we've done the hard work for you. In fact, finding the best freeware plug-ins is as easy as checking out this month's cover CD set.

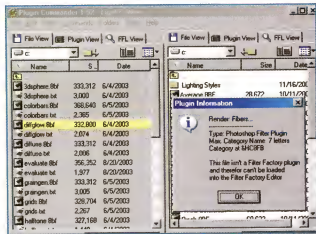
Among the plug-ins included are: 3D Sphere Generator, a filter that generates a realistic-looking three-dimensional sphere; and Evaluate, a tool that can perform over 50 unique image-processing operations, such as colour replacement and greyscale conversion (both from www.richardrosenman.com/photoshop.htm); Particle (www.ulead.com), which adds eight natural particle effects for images and selection, such as smoke, fire and clouds; and SuperPNG (www.fnordware.com/superpng), which improves on Adobe's PNG support by being faster and saving considerably smaller files.

Also be sure to check the Goodies folder on your Photoshop install CD for bonus plug-ins, including additional file formats, filters, and the now-unsupported Filter Factor module.

MANAGING YOUR WARES

The default installation path for plug-ins is Photoshop's Plug-Ins subfolder in the Windows Program Files Directory. Photoshop also permits one additional external folder to be specified in the Plug-Ins & Scratch Disks Preferences panel. Note that when making modifications involving plug-ins, whether in preferences or outside the application, you need to exit and relaunch Photoshop before the changes are recognised.

The most common type of plug-in is the filter — so much so that plug-ins are often referred to as "filters". The plug-in's type determines where it appears in Photoshop's menus. The following list includes typical plug-in types (with their extensions) and where you'll find them in Photoshop's menu bars once they're installed.



Command and conquer: Plugin Commander is the ideal tool for juggling all of your plug-ins.

- Selection (8BS) appears in the Select > Other submenu.
- Filter (8BF) is found at the bottom of the Filter menu.
- Automation (8BI) is located at the bottom of the File > Automate submenu.
- File Format (8BI) appears as supported file types in the Files of type: drop-down in the Open and/or Save dialog boxes.
- Import (8BA) is found in the File > Import submenu.
- Export (8BE) appears in the File > Export submenu.
- Parser (8BY) appears in Files of type: drop-down, or the File > Import/File > Export submenus.

The Plugin Site (www.thepluginsite.com) is definitely a candidate for your Favorites folder. It's home to a number of great resources and also produces the superb Plugin Commander for managing all your plug-ins — a full-working version of Plugin Commander Light is included on this month's cover CD set.

POWER TIPS

Once you've started fiddling with filters, add these timesaving tricks to your repertoire.

- To reapply the last applied filter, select Filter > Last Filter (Ctrl+F).
- Rather than deleting unwanted plug-ins, prefix their filenames (or parent folders) with the tilde symbol (~) so that Photoshop ignores them.
- For quick access to frequently used plug-ins, assign a keyboard shortcut to them by using the Keyboard Shortcuts editor (in Photoshop CS) to assign the desired key combination. In other versions, record the plug-in access to an action, assign the desired shortcut, then turn on the modal control/display dialog option. [▶▶▶](#)



Reading on the run

Jenneth Orantia demonstrates how you can carry thousands of books in your pocket, so you'll be ready for a great read wherever you are.

Sitting at the train station, standing in line at the bank, waiting for your appointment... If only you had something to read! But if you have a PDA, the problem becomes which book to read. The latest Stephen King thriller, a Patricia Cornwell mystery, some classic Shakespeare or Dickens, or a mega-dose of sci-fi? That's just a sample of the ebooks you can enjoy on your Palm or Pocket PC.

Sure, you don't get any of the familiar tactile sensations associated with reading a hardcopy book, but you can change the font size, look up definitions on-the-fly, quickly search for specific words, and even use your handheld's backlight as a built-in book light. And how else could you fit an entire library onto a memory card the size of a postage stamp?

READ ALL ABOUT IT

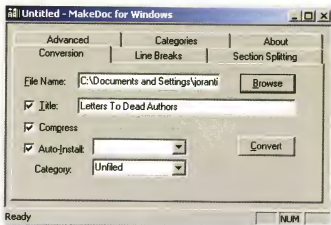
That's the good news about ebooks. The sadder side of the story is that there's no standard ebook format, even on a single platform.

The most common format is the plain-text file. This is the

de facto for classic ebooks that have passed into the public domain, been digitised and made freely available, thanks to schemes like Project Gutenberg. On the other hand, commercial ebooks are copy-protected by digital rights management (DRM) technology, meaning you may need to jump through some hoops to open a newly-purchased book — anything from entering your credit card number to “unlock” the book to activating the reader program itself.

Many publishing houses and software vendors have developed their own proprietary format that supports their brand of DRM.

Regardless of whether you've got a Palm or Pocket



Quick and dirty: MokeDocW is a simple yet effective tool for converting text files to docs.

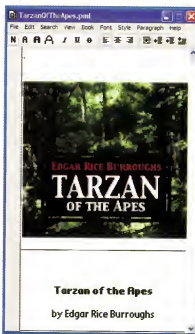
PC device, you may end up loading several readers in order to browse your digital library. However a careful choice could save you some RAM.

Popular options for Palm OS include the basic free editions of Palm Reader (www.palmdigitalmedia.com) and MobiPocket Reader (www.mobipocket.com). Like most Palm-based readers, these multi-format viewers support text files as well as ebooks prepared in the common Palm DOC format (which has no connection with Microsoft Word files) and the reader's own proprietary file. The shareware TealDoc (www.tealpoint.com) has also developed quite a following.

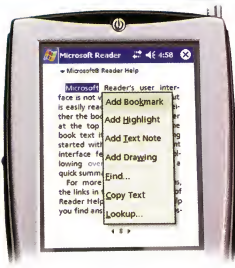
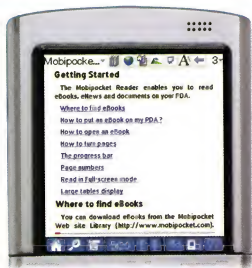
Most proprietary ebook readers are available on Palm and Pocket PC platforms. These include Palm Reader and MobiPocket Reader as well as iSilo (www.isilo.com) and TomeRaider (www.tomerarider.com). The Microsoft Reader, which supports only Microsoft's LIT format, is exclusive to the Pocket PC.

Many people choose a reader based on specific features they value. The ability to store ebooks on an external memory card is a must-have, particularly with larger ebooks that boast rich formatting, images and links. Selectable font sizes, font colour and background colour go a long way to increasing readability — especially when reading in the dark, as changing the background to black and the text to white reduces eyestrain.

On devices with rectangular screens, such as Pocket PCs and Palm devices with 320 x 480 resolution, rotating the display to landscape orientation makes for much more natural reading. The additional width means the experience is closer to reading a hardcopy book. Full-screen mode helps even more, as additional text can fit on the screen. A dictionary integrated into the reader is another nifty feature — getting a definition is as simple as tapping on the word.



Easy ebooks: use Palm's ebook Studio to create your own ebooks, with images, basic text formatting, chapter headings and more.



Of course, the format of the ebooks you have and intend to buy will play a large part in determining which reader you use. This means you may end up choosing one reader over another simply because it's the only one that can open your ebooks.

SEARCHING FOR A GOOD STORY

Now for the fun part.

Start by perusing the thousands of free public-domain ebooks downloadable from Project Gutenberg (www.gutenberg.net) and the University of Virginia Library's Etext Center (<http://etext.lib.virginia.edu/ebooks>). MemoWare (www.memoware.com) and Blackmask Online (www.blackmask.com) are also worth a visit, both offering plenty of content in several formats.

If you want current content, whip out your credit card and check out Palm Digital Media (www.palmdigitalmedia.com), where its catalogue includes latest-release titles from popular authors like Robert Ludlum, Michael Crichton and Anne Rice. These ebooks are only available in secure Palm Reader format, so you'll need Palm Reader to open them.

Similarly, MobiPocket (www.mobipocket.com) only sells ebooks in its own proprietary format, requiring installation of their reader program. Fictionwise (www.fictionwise.com) is another alternative, offering ebooks in a range of formats, allowing for more flexibility in terms of the reader used. Other multi-format sites include Powells (<http://powells.com/ebookstore/ebooks.html>), ebookMall (www.ebookmall.com), ebooks.com (www.ebooks.com) and Amazon.com (www.amazon.com).

When you consider the economic advantages that ebooks hold over their hardcopy equivalents — there's no printing and no shipping — it's disappointing that there's little difference in price. In some cases, ebooks are even more expensive.

That's not to say that bargains can't be found. Palm Digital Media regularly trims prices and offers a permanent 10% discount for readers who receive its weekly newsletter.

Fictionwise also has regular rebates and promotions on a variety of titles. Its "Buywise Club" membership program (US\$29.95 a year) is a great deal for regular readers, who receive one free book upon joining and 15% off every book purchased during the length of the membership (on top of any other discounts applicable). Members also get access to the Fictionwise Lending Library, which allows members to "borrow" an ebook for a period of up to 14 days, after which the book expires and becomes unreadable.

► **Mobipocket:** one of the fullest-featured readers in the bunch, it's available for both Palm and Pocket PC handhelds in freeware and commercial Pro versions.

► **A built-in beauty:** the slick Microsoft Reader comes pre-installed on most Pocket PCs and offers a free dictionary.

CONVERTING THE MASSES

Sometimes you'll need to convert a file from one ebook format to another. In the case of Palm handhelds, which can't read text files natively, even simple text has to be translated into a suitable format. The most basic route is to make a simple DOC file using a tool like the freeware MakeDocW (www.cognitiverooft.com). This produces a small file that can be opened by most readers. However, all formatting, images and links are lost in the process. Universal readers for the Pocket PC are more flexible, and can open most non-encrypted ebook file formats such as TXT, HTML and RTF.

Tools for creating proprietary ebook file formats on the Palm and Pocket PC platform, such as the Palm ebook Studio, are usually available at the Web site of the developer of each ebook reader.

These tools can also be used to create personal ebooks from scratch. Depending on the sophistication of the program, you can add cover images, tables of contents, images and even hyperlinks to a new ebook. Better still, Microsoft has released a handy Word add-in (a free download at www.microsoft.com/reader/downloads/rmr.asp) which places an MS Reader icon in the Word toolbar and transforms any Word document into an ebook with a single click. tiny.cc

DRM dilemma

Most commercial ebook vendors rely on Digital Rights Management (DRM) technology to prevent unauthorised distribution of their ebooks.

The security mechanism used differs between readers, with some ebook formats enforcing more onerous and restrictive requirements than others. Rather than tie the ebook to a particular "activated" reader (as is the case with Microsoft Reader), it makes more sense to link the DRM security to the ebook itself, a technique employed by Palm Reader. When buying ebooks in this format, you need to "unlock" the book when opening it for the first time by keying in the credit card number used to buy it. This deters people from distributing the ebook to the public (as they'd need to include their credit card number for it to open), and results in minimal inconvenience for the purchaser.

The Evolution revolution

Ximian's mighty Evolution is more than just an open source Outlook clone. **Mike MacCana** reveals the power of this Linux information manager.

You've swapped Windows for the Linux distro of your choice, ditched Word and Excel for OpenOffice equivalents, and brushed off Photoshop (and its product activation) in favour of GIMP. But there's still something missing — Microsoft Outlook. Where else can you find a single powerful package to handle your contacts, diary, to-do list, email and everything else that shapes your day?

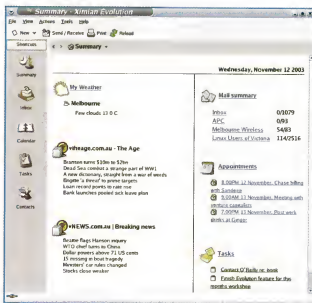
In Evolution, that's where. For many, this superb Linux application (recently bought by Novell) is the final nail in the Windows coffin. And if you're already familiar with Evolution, there's probably a lot more for you to discover.

EVOLVING FROM OUTLOOK

The latest version of Evolution, included free on this month's cover CD set, runs on Red Hat 8.0 and 9.0, Mandrake 9.1 and SuSE 8.2. There's also a copy of Outport, a third-party utility that imports your existing email, calendar, contacts and task list from Outlook's PST file into Evolution.

It's easy. Just go to Settings > Data Files to point to the PST file, select the folders to convert, set the directory where the exported files should be dumped, then click Export. In Evolution, select File > Import to bring in the data.

Evolution's easy-to-use mail, calendar, contacts and to-do modules are all self-explanatory, so here are some advanced tricks to make life even easier under Linux.



And now, the news: Evolution's Summary page can display the latest headlines from your favourite news sites and blogs.

READ ALL ABOUT IT

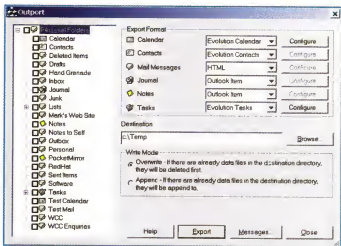
When launched, Evolution opens onto the Summary page, which mimics Outlook's Today screen to show the day's appointments, new mail and pending tasks. However, this program goes one step further by streaming headlines from news sites around the world, using RSS (Rich Site Summary).

Most of these entries are hyperlinked — click on an appointment or task to open that item, and click on a news headline to call up the complete article. Go to Tools > Customize to select which mail folders appear on the Summary page, the number of upcoming appointments displayed, and which sites you'll see headlines from.

Evolution offers a startup serve of around 30 sites, but there are thousands of RSS feeds available, ranging from mainstream commercial news media to community sites and blogs. If you want to know whether your favourite site offers an RSS channel, enter the name of a site along with the words "RSS feed" into Google and look for any hits where the site address ends in RSS, RDF or XML. These are all valid RSS sources. Blog sites based on the Blogger, LiveJournal or MovableType engines also support RSS feeds.

FILTERS RULE, OK!

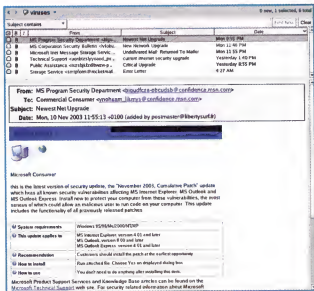
Like most modern email clients, Evolution has rule-based filters to help manage email. Filters consist of criteria and actions. If a message meets a set of user-defined criteria — such as being sent from a particular person or containing a certain word — a specific action is taken (the email might be moved to a different folder,



Exports and imports: use Outport to bring your email, calendar appointments, contacts and tasks from Outlook into Evolution.



► **Bio-filter:** Windows-based viruses can't harm Evolution, but they do waste your time. Use a simple filter to move or delete them automatically.



highlighted, forwarded to someone else, or deleted entirely).

But Evolution can also apply more exotic options, filtering messages based on email headers, patterns and the results of running them through personal shell scripts to perform any kind of check you want.

Right-click a message to set up a quick filter based on its sender, recipients or subject line, or go through the Tools > Filters menu to see more options. Here are some ideas to get you inspired.

- Evolution reads mailing-list information hidden in message headers, so it knows which list each message comes from. Use this to place messages from specific mailing lists into their own folder.
- If multiple email addresses are forwarded to your main account, a filter based on the recipient will sort messages sent to each account into individual folders.
- Use Evolution's unique scoring system to rate and highlight messages according to content. Start with a series of rules to identify criteria which could indicate the importance of the message — such as specific senders, the subject line, or body of the message containing words like urgent or ASAP. Use the Adjust Score feature to assign points to each attribute. Finally, create a filter rule for messages that exceed a certain threshold — for example, five points — using **Score is Greater than <number>** as the criteria, and set appropriate actions, such as highlighting the messages in red, flagging the status as important, or playing a special alert sound.
- Linux users won't have much use for Windows executables. In fact, most of the EXE, CMD, BAT and VBS files delivered as email attachments are concealing viruses and worms. They can't damage your system, but why even deal with them? Set up a rule called "Contains Windows Executable Attachment" and select Pipe Message to Shell Command. Now take advantage of Linux's Unix underpinnings by specifying the command:

```
grep 'name:.*\\.\\(exe\\|scr\\|bat\\|pif\\)'
```

This searches the body of the message for attachments with a filename containing EXE, SCR, BAT and PIF. Messages with any such attachment can be dealt with according to the action you specify. For example, moving the email into a special folder or dumping it directly into the trash.

- If your ISP's server runs SpamAssassin to mark suspect junk mail (rather than block it at the server), create a rule for messages where **Specific Header X-Spam-Status contains yes**. This helps Evolution recognise mail that's been flagged by SpamAssassin, so it can be redirected to a spam folder or deleted on delivery.

MANAGING EMAIL WITH VFOLDERS

Having rules that fling your messages into different folders is one great way to keep on top of the email tsunami, but for even

more control over your mail, check out Evolution's Vfolders. They look like folders but act like searches — messages appear in each folder if they match criteria you've set, and they're updated as new emails come in. "Appear" is the operative word, because it's only a representation of the message, which remains in your inbox (or any real folder to which a rule has delivered it). A message can exist in any number of Vfolders, but it's only stored once on the disk.

Want a folder that instantly displays all unread messages? Or messages you've selected to follow up? Perhaps folders to show all emails from particular contacts? A Vfolder does the trick. If all this sounds familiar, then maybe you've been hearing about the almost identical Search Folders in Outlook 2003... well, Evolution got there first!

Out of the box, Evolution has sample Vfolders for unread messages and messages you've flagged as important, but you can easily add your own by clicking New > VFolder, setting some criteria and a source (somewhere to look for messages — usually "all local folders" is fine). Even better, you can make Vfolders of Vfolders. You could create a Vfolder for all your messages from tech-related mailing lists, and another folder with just unread messages from that folder for when it's time to catch up with the latest tech news.

SYNC UP

Evolution also has some PDA-friendly tricks up its sleeve. You can synchronise the program's address book, diary, to-do list and notes with a Palm OS handheld. But with the third-party Multisync application (included on this month's cover CD set) you can also get Evolution working with a Pocket PC and mobile phones that support the IRMC syncing protocol, such as several Sony Ericsson models. Multisync also lets you sync two different copies of Evolution — perfect for keeping a desktop and notebook, or your home and work PCs, matched up.

WEB MAIL WITHOUT THE WEB

With utilities like Hotwayd (on this month's cover CD) or YahooPOPs! (<http://yahoopops.sourceforge.net>), you don't need to fire up a browser to check your Hotmail, MSN or Yahoo! email. These apps act as intermediary POP servers, which handball messages between

■ **Browser-free zone:** use Evolution in conjunction with Hotwayd and Yahoo! POPs! to check Hotmail, MSN and Yahoo! accounts.

Evolution and the Web mail server, so you can read, reply to, create and manage Web-based email services, all within Evolution's interface.

To get Hotwayd and Yahoo! POPs! working with Evolution, set up a new account with the POP server set to the machine where Hotwayd or Yahoo! POPs! is installed. Specify localhost as the SMTP server, enter your entire Web email address as the user name, and add your Web mail password.

The first Web mail session in Evolution takes longer than usual because existing messages and folders need to be downloaded. From then on, Evolution only has to fetch new email.

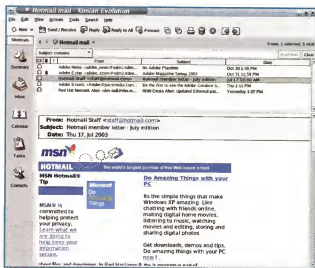
WORKING TOGETHER

So far we've explored the talents of Evolution as a standalone email client and organiser. But you'll find that Evolution is also a dab hand at working with others.

You don't need to invest in an expensive groupware server to work with your colleagues: it's easy to email appointments and tasks to others by simply right-clicking the item and choosing Forward. They'll receive the data as an iCal attachment, which Evolution (and many other mail clients, including Outlook) can add to the recipient's calendar with a click.

If your workplace uses an Exchange mail server, Evolution can get in on the action with the purchase of the Evolution Connector plug-in (US\$69 from www.ximian.com). This lets you share your calendar and to-do lists with your colleagues and access global address books, just like Outlook.

Evolution can also work with a standard LDAP server (for example,



Microsoft Exchange or the Linux-based OpenLDAP) to provide access to a company-wide address book. However, be aware that you'll need a tool like Directory Administrator if you want to add and modify entries.

ACCESS ALL AREAS

Many network administrators are wary of allowing employees to access their corporate email from outside the office. The SMTP mail protocol lacks the mechanism to ask for a password before it allows access, making it possible for spammers to flood the server. However, there are several other standards that permit companies to confidently open their email for external use.

The nicest of these is POP-before-SMTP, which lets users check for incoming email using the password-guarded POP or IMAP protocols and, if they're allowed access, permits the client machine to send messages via SMTP for a few minutes. Evolution supports POP-before-SMTP, so activate it in Evolution if your mail server supports this feature.

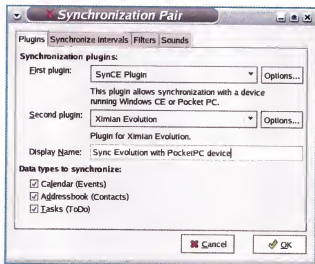
If not, there are still a few options to try. Some companies allow staff to use remote-access tools like SSH to access their networks from the Internet, as its strong authentication and encryption prevents snoopers and other network nasties from climbing onboard.

To use SSH tunnelling to access your mail server over the Net, start by adding a new account with the POP server set to localhost on port 11111, the SMTP server set to localhost, and set your username and password as per usual.

Then save the script in the box to /home/<username>/bin/maillunnel and give it execute permission. Now all you need to do to check your mail at home or on the road is to run the script. If you've got SSH access into your workplace, but no outside access to mail, save the following script into /home/username/bin/maillunnel and run it to tunnel your mail through your SSH connection:

```
#!/bin/sh
ssh -C -N -L 11111:<mail server>:80 <ssh server> -l <ssh server login user>
```

This maps port 11111 on your local machine to port 80 on the mail server, through the SSH server specified. [\[1\]](#)



■ **Pocket power:** Evolution will happily talk to both Windows-powered Pocket PCs and Palm handhelds.

apc's TOP 10 GAMES OF 2003

2003 was a huge year, so here's our selection of its ten best games, and why they earned their spot. By Justin Kranz.

10 MICROSOFT COMBAT FLIGHT SIMULATOR 3

Reviewed APC March, page 140

Microsoft has kept the fun of its flight/flight sim and brought realism up a notch. Subtitled "Battle over Europe", Combat Flight Simulator 3 goes heavy on World War II history, offering American, British and German fighters.

Onscreen, the planes are gorgeous, and the physical flight model is accurate enough to attract beginners and advanced flight-simmers who want to barrel-roll the opposition.

The Microsoft Combat Flight Simulator series won't ever rival true combat 'sims', but they aren't meant to. A fantastic depiction of a distant age, and the sheer fun this game provides makes it a real winner.



9 AGE OF MYTHOLOGY

Reviewed APC January, page 170

As the title indicates, the third chapter of Ensemble Studios' Age of Empire series wanders off the historical path — and is all better for it.

Continuing Empire's winning streak, players have to "harvest" godly favour — it's worth the

effort as an array of supernatural feats become available to the faithful.

The overhauled graphics engine renders units and maps in crisp 3D, a needed improvement from Age of Empires II's speedy, but basic, 2D visuals. And, with an expansion pack already released (AoM: Titans, playable demo on APC's December cover CD set), there's no shortage of extra playing time in the series.



8 TIGER WOODS PGA TOUR 2004

Reviewed APC December, page 141

The Tiger Woods series has progressed in so many ways that it's simply impossible for any sim golfing fan to ignore it.

Career mode is a three-headed challenge: training, a course-by-course set of skills

challenges, and a progressively harder list of tours you can play on.

Multiplayer options include access to the EA Sports Online multiplayer service and a regrettably buggy IP-to-IP mode.

Even with this slight let-down, the inclusion of a career mode that's unmatched on PC provides you with the best golf game to date.



7

COMMAND AND CONQUER: GENERALS

Reviewed in: APC May, page 150

It was the best-looking real time strategy game when APC reviewed it back in May, and it still is.

The Command and Conquer series helped pioneer the genre, but C&C: Generals has the appearance of a brash newcomer looking

to barge its way in on looks alone. But underneath the glossy exterior is a solid game.

Three factions are available — the Chinese, the US, and the Global Liberation Army (or "terrorists").

Multiplayer is a strong focus, but it won't attract the numbers captured online by the likes of Warcraft III. And, despite being more attractive, its strategic depth and balance doesn't match last year's top RTS title.



6

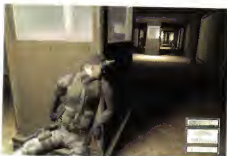
SPLINTER CELL

Reviewed APC February, page 125

Ubi Soft's not-so-humble console conversion really shines on powerful PCs. Players are solo covert operators assigned, as usual, to save the world. It has a formulaic plot line, but the way events unfold make a compelling story nonetheless. Stealth is the key here.

The audio effects are excellent, with sharp voice-acting and an inspired use of sound. But its visuals create the game's most indelible impression — light and shadow have never been used so well, going far beyond mere effects to become vital elements in game play.

Splinter Cell might have been even higher up the list if a multiplayer option was included. Nevertheless, this is still the best stealth title on PC.



5

RAINBOW SIX: RAVEN SHIELD

Reviewed APC June, page 151

Rainbow Six's visuals have finally caught up with its exacting levels of realism, creating the finest yet tactics-based first-person shooter.

The series has always emphasised meticulous planning prior to team deployment, and it's no different in Raven

Shield. Solo tactics have limited scope here; you and your team of anti-terror operatives have to work together to overcome the opposition. But players not exercising the automatic option will enjoy great flexibility.

In terms of realism, quality of action and reliance on teamwork, it's clearly superior to Counter Strike, the number one online shooter. But, unfortunately, Raven Shield doesn't yet boast a massive online player base.



4

RISE OF NATIONS

Reviewed APC August, page 146

In a field cluttered with real time strategy games, an RTS release in 2003 had to be something special to stand out of the crowd. Rise of Nations has taken the competition's strong points and welded them together into a compelling and brilliant experience.

RON's challenge level in campaign mode is engaging, and, like older vintage strategy titles, doesn't rely on contrived themes or amateur storylines to get the job done. But it's not quite as nimble in multiplayer mode.

You can play as any one of 18 different nations, running across eight time periods. Want to see how the Aztecs would fare in the information age? Here's your chance.

It may not be the year's best-looking RTS game, but it has left the strongest impression.



3

F1 CHALLENGE '99-'02

Reviewed APC September, page 147

While Live For Speed S1 has cornered the conventional market, Electronic Arts' definitive sim has done the same for Formula One. As the last title in the series, everything spanning several years of racing has been crammed in — every car, track and team.

F1 Challenge's real meat lies in its telemetry options and track re-creations. Like LFS, success at the higher levels of F1 Challenge requires dedication and the ability to perform in the pits as much as the tarmac.

It's really two games: the preparation, then the race. The balance is almost perfect.

Makers Image Space poured everything they had into this, and it shows. For dedicated driving simulator fans, this is essential.



2

LIVE FOR SPEED 51

Reviewed APC October, page 154

Live For Speed is the ultimate garage developer's creation. Putting the efforts of much better-resourced development teams to shame, a trio of coders put this masterful racing sim together in their spare time.

The formula is ingenious. Limited trucks and cars encourage players to master each individually. The vehicles are offered in a logical progression, starting with a souped-up hatchback, and progressing through the turbo ranks until a pair of overpowered roadsters becomes available.

Abundant car setup options allow players to tweak their cars far beyond the standard speed-versus-traction approach.

While there is a single-player mode, the game is intended for online play. A growing online community has cemented the game's popularity, with individual performances on the Internet tracked by the LFS World service.



Players can download fast setups, race and hotlap replays to push their own efforts. There are even online racing teams for competitive play, complete with custom paint jobs. If you've ever picked up a steering wheel peripheral in anger, you owe it to yourself to check this out.

Expect the online driving arena to explode in the next year or two, but it's going to take a monumental effort to catch up to this.

And Live For Speed's creators aren't resting on their laurels — they're already working on the next instalment of the game.

1

GRAND THEFT AUTO: VICE CITY

Reviewed APC July, page 150

Remember *Scarface*? How about *Miami Vice*? Rockstar Games does, and a whole lot of other movies and TV shows, to boot. Grand Theft Auto: Vice City is funny, dark, even menacing, but it always remains retro.

You know a game has hit the big time when Hollywood stars line up to feature, and actor Ray Liotta throws himself into the lead role of Tommy Vercetti.

The tale of mob intrigue unfolds amid a very '80s Miami-style setting. With everything from model helicopters to motorcycles to control, things don't get boring in GTA's sprawling world. And though it's free-form, there are always missions, enabling you to push the narrative along.



Vercetti is fresh out of jail and looking to open up operations. But when his stakeholders get ripped off, it falls to him to make matters right, and gain influence.

The game's perfect pace and plot tension are supported by a solid graphics engine and exquisite sound. The audio highlight? Car radios which feature multiple radio stations, complete with dozens of tracks and DJ patter.

This belongs alongside your *Goodfellas*, *The Godfather* and *The Sopranos* DVDs. Every outstanding aspect of Vice City reinforces a simple fact about the industry at present: no other outfit even comes near to getting games as close to movies as Rockstar.

It doesn't try or manage to conjure up sentimentality, but our bet is, if any company can make a game that taps into the wider emotional spectrum — it'll be Rockstar. Until then, uncover your inner criminal.



2003 GAMING DISASTERS

HALF LIFE 2 CODE LEAK



Valve Software — developers of one of the year's hottest properties — delayed Half Life 2's release from September 2003 to sometime in 2004 without

explanation. The reason? Valve admits a hacker stole 43MB of source code. The company forgot to add that the same hacker also took 1.8GB of operational beta code. A playable beta that swept the file-sharing networks quickly reminded them.

COLIN MCRAE'S DEBACLE

The legendary Colin McRae rally series



arrived on the PC a great deal later than on its console counterparts. So late in fact, that the title subject had changes in driving teams. The publisher pressed

on and released a buggy and superficial PC version that bases the main playing mode around the old team. Gamers soon made their opinions of the product clear, bombarding developer Codemasters with angry feedback.

ENTER THE MATRIX — AT YOUR OWN RISK



Meant to be the glossy game companion to coincide with *The Matrix Reloaded*, Enter the Matrix turned out to be a flash in the pan of the lowest order. The game

proved to be a major let-down: decidedly average in graphics and rapidly tiresome. The only redeeming feature was extra movie footage. Given its short lifespan, forking out \$90 for this offering would lead many to expect a movie as well.

WHERE ARE THE RPGS?

One genre that didn't stand out in 2003 was role playing games (RPGs). After the high of 2002's *Neverwinter Nights*, there was precious little to get excited about. Asheron's Call II (Microsoft) was good, and Temple of Elemental Evil (Atari) tried hard, but faltered. Few other titles managed to trump last year's winners. Thankfully, 2004 holds much hope, with *EverQuest II* looking a treat.



PC

CALL OF DUTY

Capping off the prolonged World War 2 shooter craze with a flourish, Call of Duty is the cream of an outstanding crop. By Justin Kranz.

Powered by a Quake 3: Arena engine tweaked beyond recognition, Call of Duty takes the best parts of leading WWII titles and makes them even better. It's a first-person shooter, much like Medal of Honor: Allied Assault, Battlefield 1942 and Return to Castle Wolfenstein, yet it distinguishes itself by pushing the team-based element even further.

The action steps through American, British and, ultimately, Russian campaigns in the war, requiring you to change into each country's fatigues for every engagement. Scripted action is used to great effect in the game, which means you rely on your comrades to an extent rarely explored before — your team doesn't just loaf around while you single-handedly win the war. They cover for you, and more often than not it's your decisions that lead them into harm's way, not poor AI.

Surprisingly, despite concerted efforts towards making you feel like you're "one of the lads", including some great dialogue work, there's no overall story running throughout the campaign. It's the game's one slightly disjointed feature — one minute you're doing it for Uncle Sam, the next for OI' Blighity, and eventually onward for Mother Russia.

There are some real pulse-racing moments to be had as you engage opponents' heavily-fortified positions, in which often all you can see is muzzle fire from a machine gun nest. Items such as grenades become

invaluable as key deadlock-breakers in fraught circumstances. Your team also comes in handy, and often you'll find the solution to an impasse taken out of your hands by your band of brothers.

The intelligence with which the game runs both friendly and enemy troops is commendable. Call of Duty avoids the two glaring mistakes made by many games. Where most overcompensate for their lack of strategic finesse by endowing troops with incredibly accurate aim, COD's clever AI makes such a measure unnecessary. Nor does it allow any troops to step like lambs into the slaughter. The end result is that you feel like you're up against other humans, the highest accolade you can give to games of this type.

Call of Duty hasn't withheld on multiplayer modes either. In addition to solo fragging and team death-match options, there's a trio of interesting variants.

Search and Destroy is essentially Counter-Strike: one team has to blow a target up, and the other team has to stop them. Players don't respawn after dying, rather they have to wait and watch until either the objective is accomplished or one team is entirely wiped out.

The same "one life per round" formula applies to the Capture The Flag-esque Retrieval, except this time a team has to grab an object from the enemy base and get it to theirs.



► **Enforcing the curfew:** O'Reilly was a stickler for the rules.

Behind Enemy Lines is a red rover-style death-match mode, and sees Allied players scoring more points the longer they stay alive. Die at the hands of an Axis player and it's their turn to be an Allied soldier.

Call of Duty and Max Payne 2 (reviewed on page 142) both illustrate how critical a sense of dramatic tension has become in contemporary games production. Without the fine scripting, great squad-based dynamics and dialogue, and intelligent sequencing of objectives, Call of Duty would just be another World War II shooter. Polishing these once-overlooked aspects pushes the game into stellar territory.

Facing off against a flood of shooter titles, this game had to be pretty remarkable to make itself stand out, and Activision has achieved this objective in outstanding form. Buy it, if only to renew your faith in the ability of games to suspend disbelief, and let its developers move onto fresher subject material.

Online www.callofduty.com

Price \$89.95

Verdict ●●●●●

PRO EVOLUTION SOCCER 3

As FIFA puts the boot into our national aspirations, Konami's outstanding testament to the beautiful game couldn't be better-timed.

Saying Pro Evolution Soccer is the best soccer game on PC doesn't properly convey the full weight of this title. The limited stream of past footballing titles on PC has been characterised by shallow gameplay. Not only does PES3 offer the playing finesse of a champion's league contender, it looks smarter than David Beckham at a charity fundraiser.

The crucial visual ingredients of this game — its pitch and players — are exquisite. Past console versions of PES3 have relied on Renderware-generated graphics, with functional but indistinct models. Konami has ditched the middleware and whipped up its own graphics engine, which works a treat, especially on PC. Razor-sharp visuals and photo-realistic faces are the new standard, and they look glorious. The programming team obviously went to optimisation class

too: the engine runs very smoothly at high resolution.

The animation of the players deserves special mention. For football watchers, there's little to differentiate between textbook soccer moves and their digital representation. Arm movement and torso-shifting are just as well modelled as the leg motion, and the interaction with the field and the ball is exceedingly precise.

PES3 employs a variety of transitional animations, making players' movements appear life-like without giving the impression of taking control away. The animations are contextual — players know enough to trap a waist-high ball that intersects their path, for instance.

Excellence of visuals aside, the single greatest element of PES3 lies in its control and quality of play. There is an abundance of controls, and no one-button solutions for getting past a defender. The special moves on offer take some dexterity and, as in real life, are rarely used. Far more important is timing and operation within your formation.

The way the game gels together is best demonstrated in defence. Holding down a button allows your player to home in on the ball carrier. Holding down a second button sends another defender over to assist. However this pulls your defensive line out of shape, making a possible opening for the opposition to exploit. This simple fundamental is rarely executed properly in digital form. In PES3, this, along with other equally basic principles, form the bedrock of the gameplay, making for limited scoring opportunities. Generating those chances is as much down to brainpower as manual dexterity.

The abundant blessings of the control system give rise to one concern for PC players. To make the most of the experience, players need to have a dual-analogue style controller, like the PS2's dual shock. It's not impossible to play without one, but the myriad of controls available lends itself best to this



▶ **Watch that hand:** Maradona never did quite get the rules.

layout. If you have the means, get hold of a PS2 controller plus a USB adaptor — it's by far the easiest way to play.

Multiplayer is also restricted to contests played out on a single screen. Rumours abound that the next PES title will support Internet-multiplayer, but for now sharing a screen is the closest you'll get. Games involving two or more players a side are particularly amusing; novices intent on solo ball-hogging runs will be dissected by players with a keen awareness of the value of running freely off the ball. It reflects a PES philosophy that punishes arcade-style play and rewards methodical build-up — just like the real thing.

The game's single-player aspects are just as rewarding. Winning matches in any mode gives you PES currency, which can be used to "buy" increasingly useful option modes, teams and players. Unlocking the full list takes a lot of time, and best of all, it's a meaningful journey. The game's "Master League" mode outstays even the lure of unlocking classic teams and fabulous past players. Players have to scale four divisions on the road to becoming champions. As it's almost impossible to breeze through the cream of the Premier league with a bunch of gifted part-timers, players need to wheel and deal for staff as well.

The Master League mode also integrates brilliantly with multiplayer. Take your squad of invincibles and compete against the teams of also-rans your mates have trained from day one. The only downside is that due to Konami's limited licensing spend, many player and team names have been slightly adjusted. However, players can edit names to match appearances.

Pro Evolution Soccer 3 is a brilliant debut on PC for the series. If sports fans can find an adequate controller-device, there's no reason not to start practising for the World Cup.

Online www.atari.com.au

Price \$89.95

Verdict ●●●●●



▶ **Bend it like Beckham:** first the boots, next the haircut.



▶ **Aerial advantage:** boot in back pocket trick never fails.

COUNTER-STRIKE: CONDITION ZERO

PC

Counter-Strike was the squad-based combat mod that became the most popular online first-person shooter ever. Condition Zero is meant to be both a single and multiplayer game, with missing squad members replaceable with AI-controlled "bots".

Counter-Strike's online credentials were never in doubt. It was always going to be the single-player component that would make or break Condition Zero. And, sadly, broke it is.

The storyline gives rise to the first beef. Rather than an extended campaign with linked missions, à la the Rainbow Six series of games, it's been split up into 18 bite-sized missions. It

leaves a disjointed impression to the game, and lacks the same build-up or drama of a properly engineered plot.

Ammunition is carefully rationed out, and you can't even use the weapons dropped by downed enemies. This might have been par for the course three years ago, but game design principles have advanced since then.

Then there's the squad AI. Interaction with your team is extremely limited, which may explain their reticence to do anything remotely constructive. Call of Duty is set 50 years ago and CPU-controlled team-mates are immeasurably smarter in that game. They certainly don't get mixed up as often with their pathfinding, or tumble around getting shot to pieces, a Condition Zero hallmark. Enemy AI is a little better, but decision-making still seems a sore point. Half the time they'll ignore perfectly good cover to go out in a blaze of glory. Hardly the stuff of wily opposition.

The dated Half Life engine is also showing its age. Vehicles can't be driven, walls lack texture, and interaction with the environment is minimal. Fences can't be scaled by your highly-trained anti-terror operative; instead, you have to drag boxes and crates clumsily and jump over them.



Up you, Ali: attack isn't always the best form of defence.



Up your alley: a trip to the shops requires preparation.

That said, these shortcomings don't alter the appeal of multiplayer CS, supported in Condition Zero. Using bots on multiplayer maps makes for a useful practice tool, especially for players without a fast Internet connection.

Even so, with Half Life 2 on the horizon — and presumably Counter-Strike 2 — there's not enough here unless you're new to the game. And, these days, not many gamers fit that description.

Online www.cs-conditionzero.com

Price \$69.95

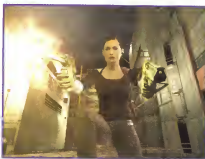
Verdict ●●●○○○

MAX PAYNE 2

PC, PS2, Xbox

Max is back, and the story-writing skills of the Rockstar team have been pushed to the limit.

In the original game, Max avenged the murder of his family. In the sequel, subtitled The Fall of Max Payne, not only do players control the title subject, but an extra player by the name of Mona Sax. She's an assassin with an equally dark past to Max.



Tough love: Mana can be very persuasive.

The game's storyline sees past events engulf both characters. The original's trademark touches — Matrix-style bullet time and a slick 3D engine — have been enhanced and improved. Also impressive is the inclusion of the Havok physics engine. Now everything from shelves to boxes to chairs can be knocked around in smooth, sharp 3D.

There's simply no company putting out games with the atmosphere and finish that typifies Rockstar Games' efforts. Including a love story subplot in a game would be tantamount to suicide for a lesser outfit. Max Payne 2 rises to the occasion in fine style as both an adrenaline-charged action game and as mature interactive fiction.

Online www.maxpayne2.com

Price \$89.95

Verdict ●●●●●

CRIMSON SKIES

Xbox

The console version of this biplane-dogfight contest does more than mere justice to its barnstorming PC original, but the plot takes some getting used to.

In Microsoft's version of the 1930's, American society has disintegrated and air travel replaces land transport. You're Nathan Zachary — equal parts James Bond and Baron von Richthofen — leader of the Fortune Hunters, a squadron of "air pirates" seeking the killers of a good mate.

Basic flight is meant rapidly to become second nature for players. Both analogue sticks are used to control your aircraft, with the right stick used to roll and initiate special manoeuvres, and the left for basic navigation.

The meat of the game largely consists of getting your plane behind someone else's and unleashing a barrage. If done correctly, smoke spews, flames erupt and another one bites the dust.

An inspired system on Xbox Live promises heavy multiplayer support. It's addictive enough to keep players coming back long after the single-player campaign palls.



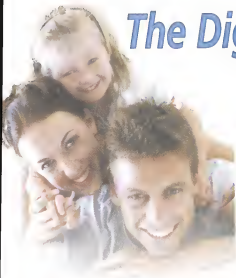
Make my day: Nathan Zachary hits the spot again.

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Verdict ●●●●●

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In the February issue of

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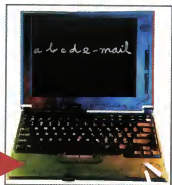
**Broadband boom!**

Whether you're ready to ditch dialup for ADSL, or are already cruising along in the fast lane, you can't afford to miss the February issue of APC. We've surveyed the ISP scene to report on Australia's best unlimited plans; reviewed the latest modems and routers, and checked out which firewalls you can trust to shut out the snoops. Plus, we present the expert's guide to searching and the secrets of eBay success.

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Heading back to school, college or uni? We've tracked down the best value notebooks for your limited budget — from slimline to Centrino to super-sized screens, and all under \$3,000!

Also featured in our expert Labs Challenge shoot-outs: high-speed personal laser printers and graphics tablets.

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Product reviews including the latest Tablet PCs, two PC-powered home media hubs, and a preview of VisualStudio.NET 2004; 101 classic moments in computing; building a games server, slashing Windows' start-up time and tapping into RSS news feeds; plus two CDs full of great software, including Borland's JBuilder X Personal Edition.

It's all in the February issue of APC — on sale January 21.

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HP Desk Jet 400/500 Series	6	8A-BKL
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CANON BJC-3000/6000/8000 Series	3x8	47-CLR
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EPSON Stylus Colour iPRO/XL	3x4	16-CLR
EPSON Stylus 820/colour II/III	3x12	24-CLR
EPSON Stylus Colour 200/300/400/500/600/800/850/1520	3x12	34A-CLR
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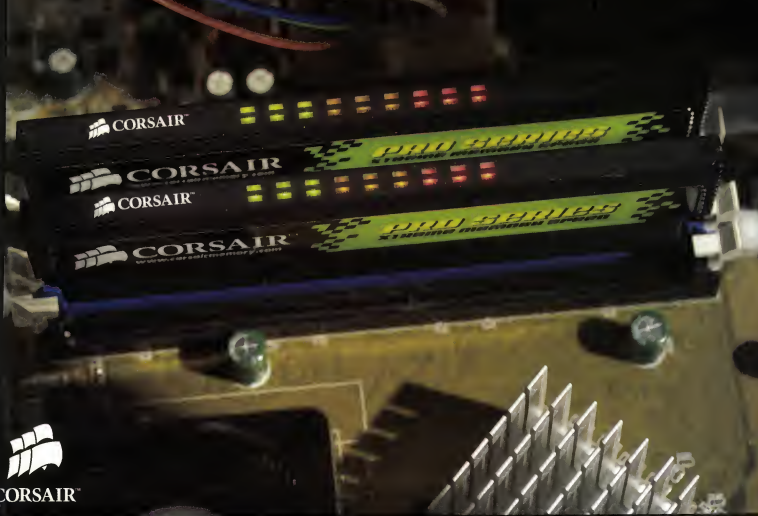
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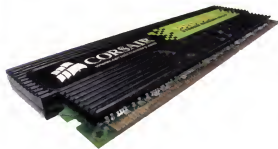
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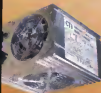


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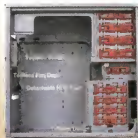
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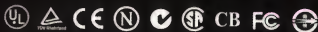


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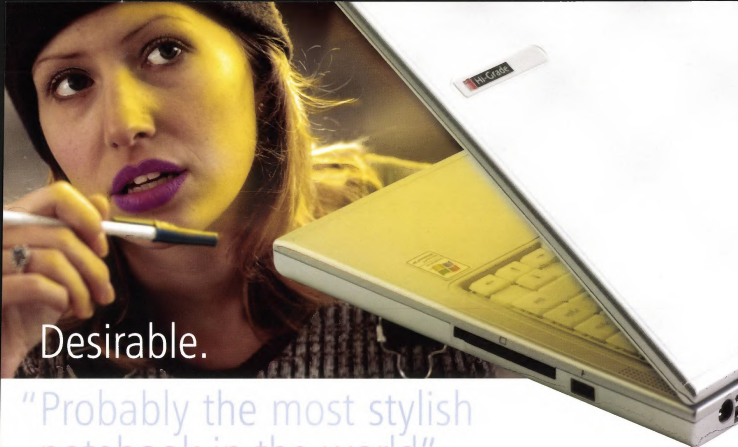
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